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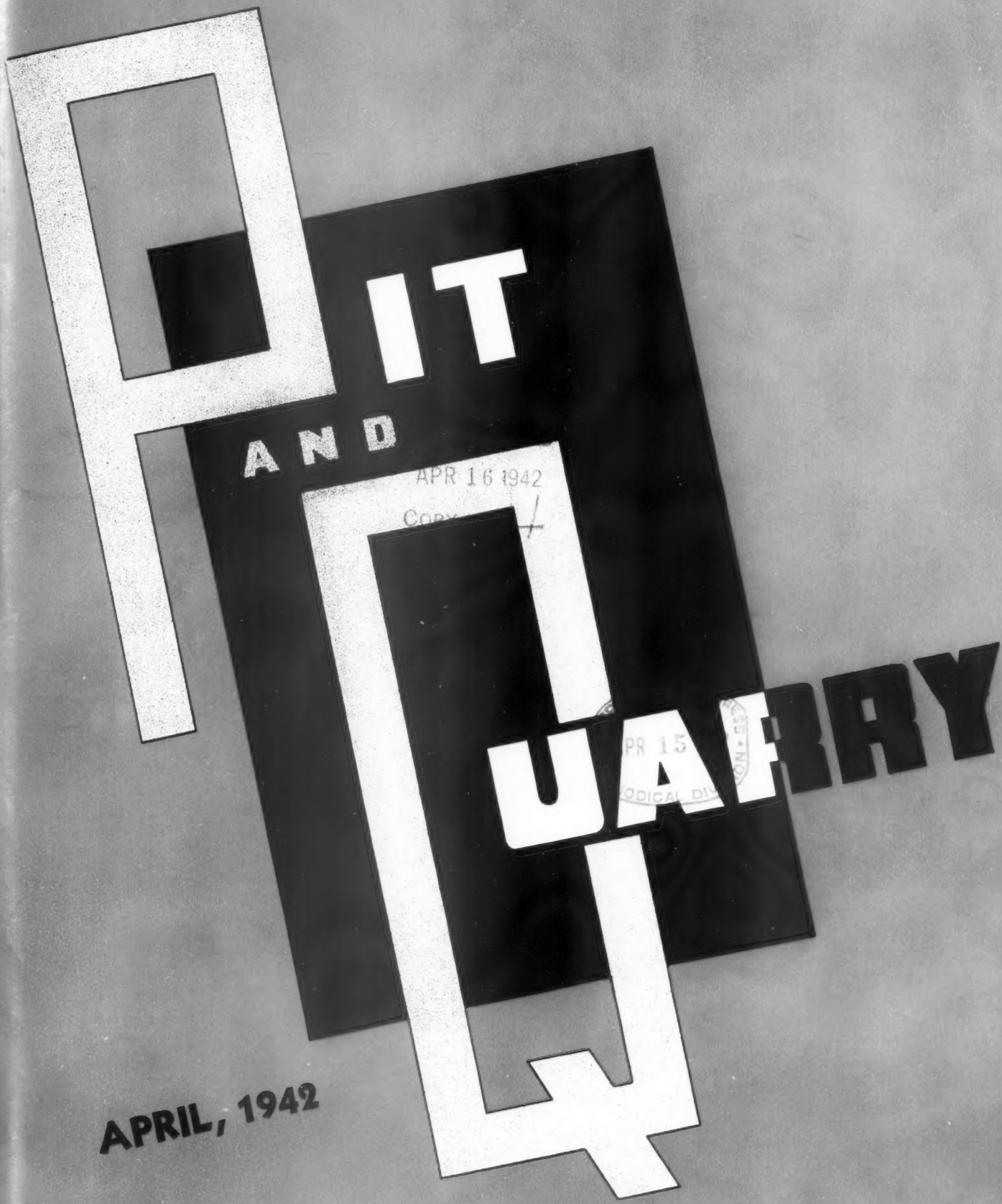


LUDLOW-SAYLOR
CONTROLLED-TEMPER SUPER-LOY
WOVEN WIRE SCREENS
for super-severe service

●

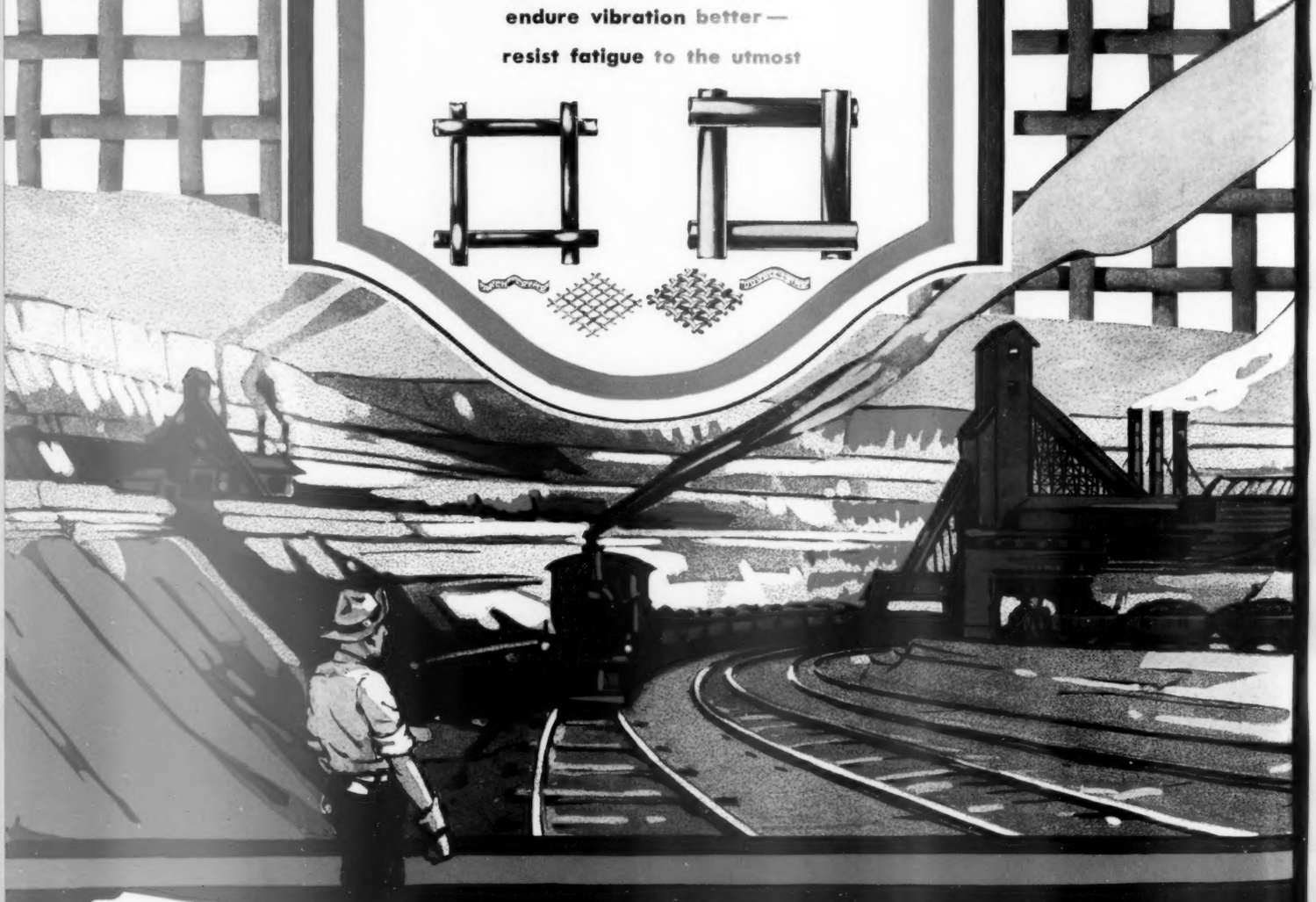
SUPER-HARD, SUPER-TOUGH, SUPER-STRONG

CONTROLLED-TEMPER SUPER-LOY
WOVEN WIRE SCREENS

withstand abrasion longer—

endure vibration better—

resist fatigue to the utmost



The background at top of page shows the "Perfect" Double-Crimp Weave.

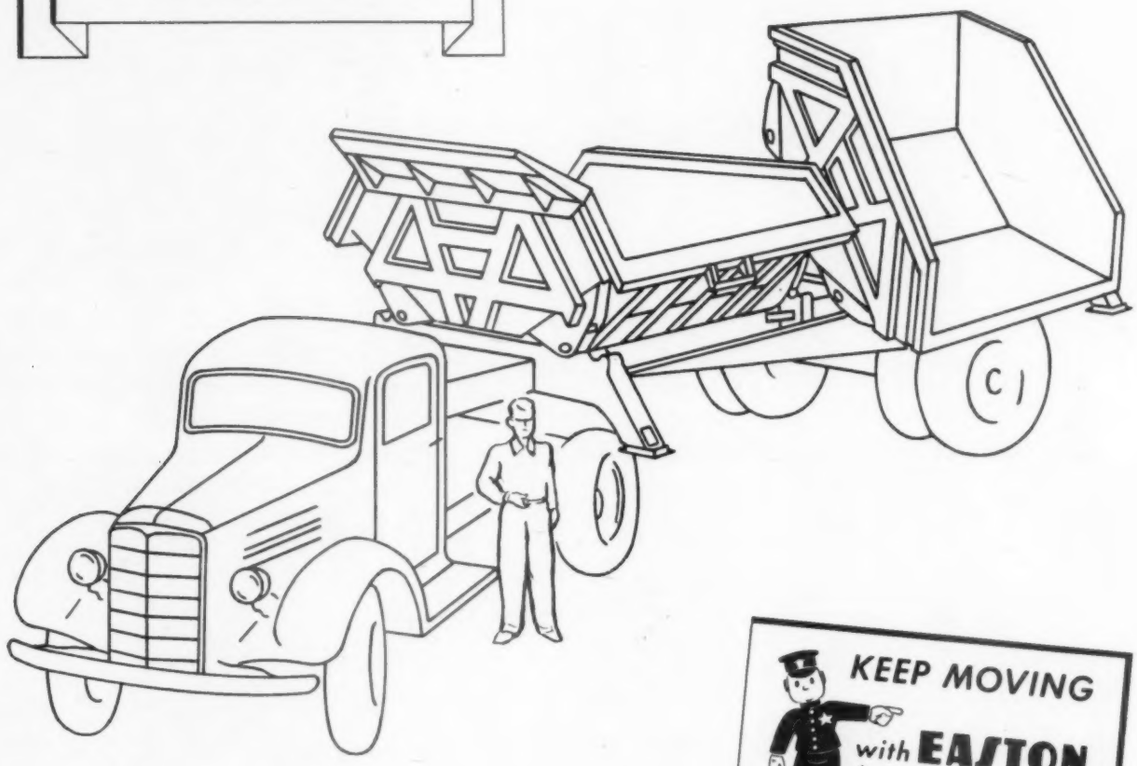
The small cuts in the center panel compare Arch-Crimp Weave and Double-Crimp Weave.

The border at foot of page shows "Perfect" Double-Crimp Steel Wire Cloth which has been hot-dip galvanized after weaving.

Samples on request.

The LUDLOW-SAYLOR
WIRE COMPANY
SAINT LOUIS

EASTON DOUBLE-BODIED
PHOENIX SEMI-TRAILER
(TRACKLESS MINE CAR)



Problem: Big Load, Small Hopper

The problem was to haul a big load from the shovel to be dumped into a small hopper opening. To save fuel, tires and other haulage costs it was found desirable to use Semi-Trailers carrying comparatively large loads. But 17 tons entering the small hopper in one discharge would choke the crusher.

To meet requirements, the container, which would normally be a body of 17 tons capacity, or larger, was divided into two sections each of which will be dumped independently. The half-loads discharged will be easily handled by the crusher, while the operator benefits from all the advantages of Easton Semi-Trailer Haulage... including high speed, low costs, and big payloads.

A new idea? No. This unit is now being built for a Southern producer. But, in principle, it was blueprinted at Easton several years ago. It's the new application and the sound engineering which make it interesting. Also, it serves to illustrate how an Easton Survey, tapping a limitless reservoir of quarry haulage experience, might help you. That is why we urge our friends to let Easton Engineers study their problems now and plan ahead for the future.

Our first job today is to meet wartime handling requirements. Our production facilities are turned to that effort. But there's no priority on ideas. Easton experts will go all out to help you.

EASTON

CARS · SEMI-TRAILERS · TRUCK
BODIES · FOR QUARRY SERVICE

EASTON CAR & CONSTRUCTION CO., EASTON, PA.

PIT AND QUARRY, April, 1942, Vol. 34, No. 10. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago, Ill. Subscription price $1 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $1 additional for each year. Single copies 25 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1879.

THE BASIC LOADING TOOL

OF THE ECONOMY-MINDED SAND, GRAVEL OR STONE PRODUCER IS A MODERN PORTABLE

BUCKET LOADER

FOR SPEED IN HANDLING YARDAGE

FOR FLEXIBILITY OF USE

FOR INVESTMENT ECONOMY

FOR HOLDING DOWN OPERATING COSTS

Model 80 Loader with Special Avalanche Protection Plates

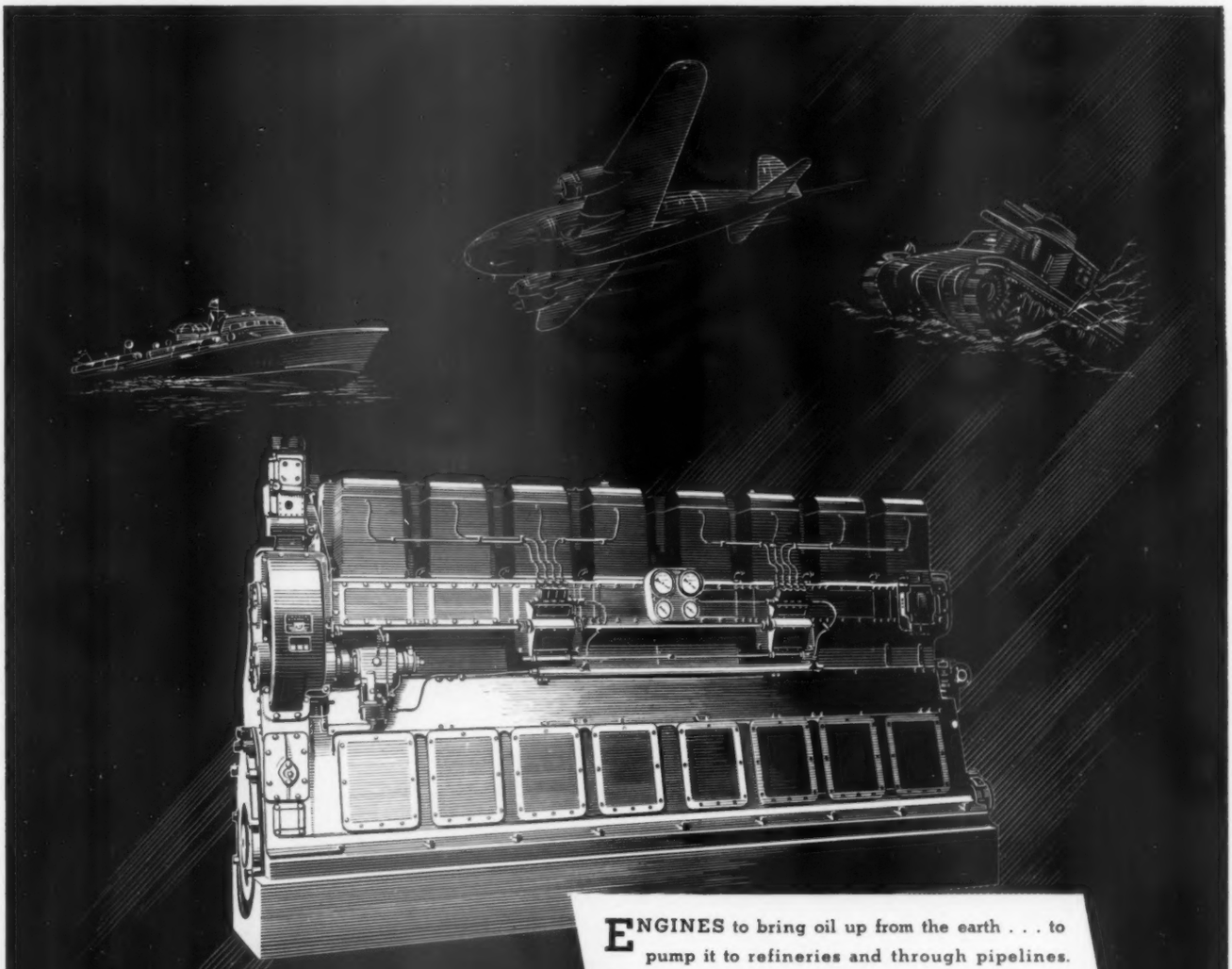
Haiss first developed the Bucket Loader as a first class, heavy-duty working tool 29 years ago...Through all the intervening time Haiss has sponsored improvements which have maintained the Loader in its position as the most economical of all types of equipment for loading trucks with loose materials...NOW, with highly mobile models on pneumatic tires, and creeper type machines up to 8 yds. a minute capacity, the Haiss Loader is still "out in front" where cost-per-yard governs an operator's choice of equipment. Catalogs on request.

GEORGE HAISS MANUFACTURING CO., INC., 142nd ST. and RIDER AVE., NEW YORK CITY

HAISS QUALITY EQUIPMENT FOR 50 YEARS 1892 ★ 1942

HAISS

PORTABLE CONVEYORS ★ LOADERS ★ CLAMSHELL BUCKETS



Out of these....

ENGINES OF PEACE!

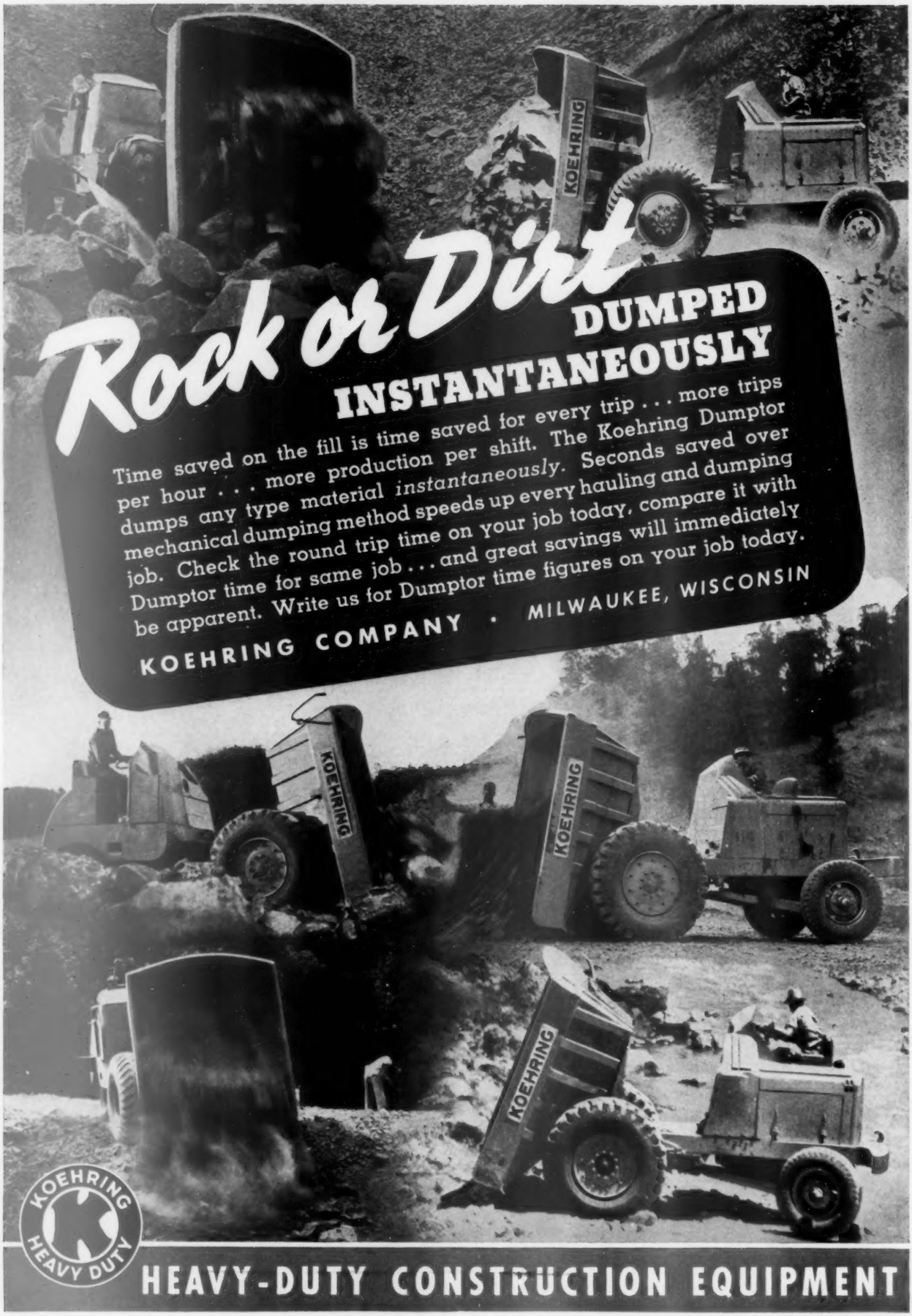
ENGINES to bring oil up from the earth . . . to pump it to refineries and through pipelines. Engines to draw gas from American soil and carry it to thousands of homes and defense industries . . . to strip it of precious gasoline for American planes and tanks and trucks. Engines to compress ammonia to make gunpowder . . . to generate electricity for farms and factories. Engines to pack compressed air into torpedoes and discharge tubes . . . to power battleships, submarines, patrol vessels, mine layers, cargo ships. Yes! Engines of Destruction . . . to thwart those who would destroy us!

These are the things to which Cooper-Bessemer factories are dedicated . . . the tasks for which our workers are girded! These are the engines we must build today, to gain our Victory tomorrow . . . Out of them, will come better Engines of Peace!

THE COOPER-BESSEMER CORPORATION
Mount Vernon, Ohio

Cooper-Bessemer

ENGINE BUILDERS SINCE 1833


Rock or Dirt
DUMPED
INSTANTANEOUSLY
Time saved on the fill is time saved for every trip . . . more trips per hour . . . more production per shift. The Koehring Dumptor dumps any type material *instantaneously*. Seconds saved over mechanical dumping method speeds up every hauling and dumping job. Check the round trip time on your job today, compare it with Dumptor time for same job . . . and great savings will immediately be apparent. Write us for Dumptor time figures on your job today.
KOEHRING COMPANY · MILWAUKEE, WISCONSIN
KOEHRING
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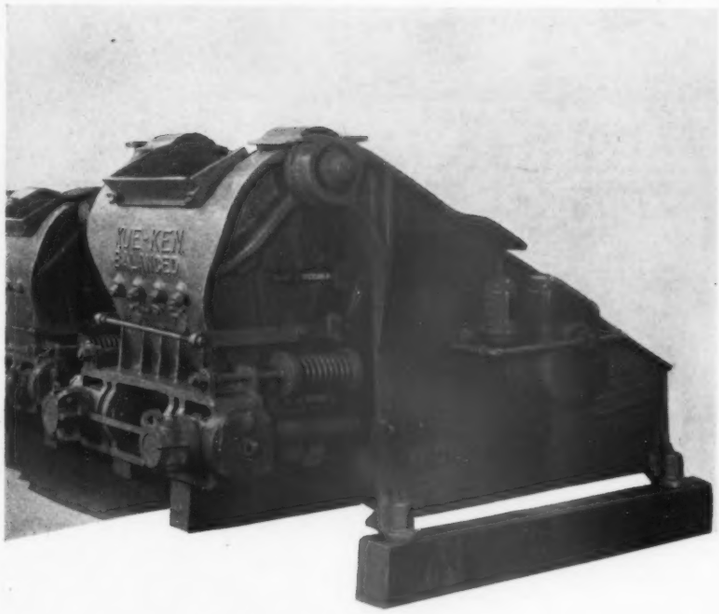
KOEHRING
HEAVY DUTY
HEAVY-DUTY CONSTRUCTION EQUIPMENT

WHAT'S YOUR PROBLEM?



Crushing costs too high?

Not enough capacity?

Not the right product?

Foundations too expensive?

Power costs too high?

Too heavy to move easily?

IF ANY OF THESE BOTHER YOU, A KUE-KEN BALANCED CRUSHER CAN HELP YOU—

HERE'S HOW!

On jobs all over the world, the KUE-KEN principle of crushing without abrasion is giving jaw plate life of two to ten times as much as ordinary crushers previously used. Perfect lubrication, low bearing pressures plus sealing in a dust tight housing, is giving trouble free operation never before known with ordinary crushers.

A KUE-KEN crushes two to five times more than *any other crusher* of equal jaw size.

A KUE-KEN takes a large feed and crushes it fine in a single pass, making a product that meets specifications of State Engineers.

Perfect balance possible only with a KUE-KEN eliminates need of heavy foundations. One operator has his KUE-KEN three stories high. The savings made in building construction and elimination of unnecessary elevators paid for his KUE-KEN.

Power consumption compared on a capacity basis is only ⅓ to ½ as much as ordinary crushers. The KUE-KEN weighs ½ to ⅓ as much as crushers of equal capacity. On every job where a KUE-KEN has replaced another make of crusher, the weight has been never more than ½ as much and the capacity has, in many cases, been increased as much as 5 times!

WRITE TODAY FOR COMPLETE DETAILS.

400 CHESTNUT STREET, OAKLAND, CALIF.

STRAUB MFG. CO.

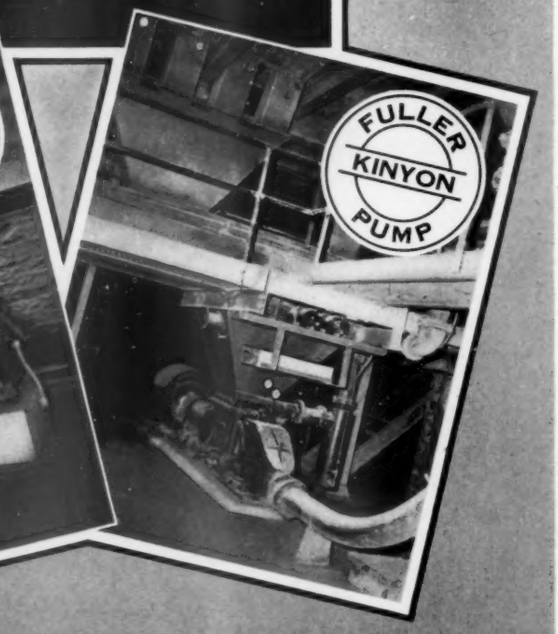
Kue-Ken Balanced Crushers	Rib Cone Ball Mills	Screenwheel Classifiers
Overhead Eccentric Crushers	Feeders	Amalgamation Barrels
Concentrating Tables	Spiral Classifiers	Standard or Sectionalized

ALL-AROUND PLANT EFFICIENCY *with* FULLER EQUIPMENT

Practically all Portland cement plants in the country take full advantage of Fuller equipment whenever and wherever possible. Cement-plant men have learned that Fuller equipment is good insurance . . . equipment that will give them production, month in and month out, with the least possible trouble at minimum operating expense. Illustrated on this page is only a small part of Fuller equipment installed in one plant in the Lehigh Valley cement district.

FULLER CEMENT COOLER: Installation of coolers for cooling finished cement for delivery to storage silos. Eight coolers are in operation, reducing temperature from 300 deg. F. at the mills to approximately 144 deg. F. single pass, 114 deg. F. double pass, in the silos. Cooler units have a capacity of 50 barrels per hour each.

FULLER ROTARY COMPRESSOR: Photograph shows a Fuller Rotary Compressor furnishing air to a Fuller-Kinyon Pump transporting cooled cement to silos. Capacity 1380 C.F.M. Six Fuller Rotaries are installed in this plant. Compressors are "spotted" throughout the plant . . . air when and where required, and at pressures needed to do the job economically. No line losses or costly reduction of pressures.



FULLER-KINYON PUMP: Illustrated is the Type H, 8-in. Fuller-Kinyon Pump which conveys finished Portland cement from cement coolers to storage silos, 400 barrels per hour. Conveying distance approximately 600 feet, with a lift of about 110 feet above the pump.

Additional Fuller equipment installed: Nine Fuller Air-Quenching Clinker Coolers. The Airveyor Pneumatic Conveying System for transporting coal from coal crusher to nine unit pulverizers.

G-25

FULLER COMPANY

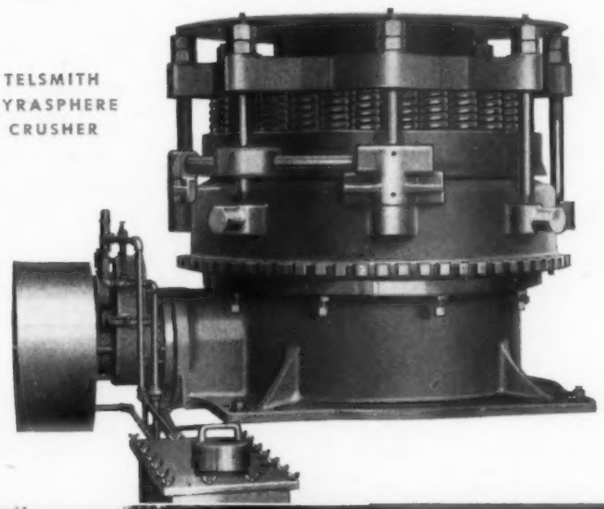
CATASAUQUA — PENNSYLVANIA

CHICAGO—Marquette Bldg. SAN FRANCISCO—Chancery Bldg.

FOR DEFENSE
Aggregate Plants
...by
TELSMITH

Like hundreds of Telsmith plants all over the world, these new rock crushing and gravel washing plants have operated smoothly, efficiently and profitably right from the start. Most of them are operating on defense work, where the production pressure is tremendous. A Telsmith plant means the latest in equipment—crushers to bin gates—Telsmith-designed-and-built for extra staying power, greater flexibility and capacity, lower operating and upkeep costs. And Telsmith *Balanced* Engineering Service and centralized responsibility fits that plant to your own particular needs. *Write for Bulletin EP-15.*

TELSMITH
GYRASPHERE
CRUSHER



SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE, WISCONSIN

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MP-3

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Charleston Tractor & Eqpt. Corp. Charleston, W. Va.
Roanoke Trac. & Eqpt. Co. Roanoke, Va.
Wilson-Weesner-Wilkinson Co. Knoxville and Nashville, Tenn.
G. F. Seeley & Co. Toronto, Ont.

TAKE FRICTION OUT OF YOUR PLANT

SAVE MACHINES

LIME MANUFACTURER: "Am using LUBRIPLATE No. 130-AA on steam shovel connecting rods, chains and cables and on locomotive rod bearings and gears. Equipment is exposed to elements and stone dust. We show a great increase in life of machine parts since using LUBRIPLATE."

SAVE TIME

GENERAL CONTRACTOR: "Have used LUBRIPLATE for many years. During a recent large highway job where we had seven big 'Cats' in service LUBRIPLATE had an excellent opportunity to show up its real efficiency in transmissions, final drives and track rolls."

SAVE COST

TRACTOR MANUFACTURER: "We put 70 pounds of LUBRIPLATE No. 25 in the transmission of a tractor. It was then run 4900 hours without grease change. When we inspected gears they were smooth as glass without a mark. The LUBRIPLATE was still as good as when put into service."

SAVE WORRY

CALIFORNIA MINE: "We use LUBRIPLATE Nos. 110 and 130-A on our Link-Belt draglines with the result of reduction of both power and upkeep costs. Formerly lubricated machines every three hours. Now, with LUBRIPLATE, every twelve hours."

7 FACTS ABOUT LUBRIPLATE

1. *LUBRIPLATE produces an ultra-smooth, wear-resisting bearing surface.* 2. *LUBRIPLATE reduces friction, thus lowering maintenance and power costs.* 3. *LUBRIPLATE resists rust, corrosion and pitting.* 4. *Most LUBRIPLATE products are white. LUBRIPLATE assures clean lubrication.* 5. *LUBRIPLATE outlasts ordinary lubricants many times.* 6. *LUBRIPLATE is economical — a little goes a long way.* 7. *LUBRIPLATE is available in fluid and grease types for every need.*

DON'T let friction get in and sabotage your precious production machines that are so badly needed these days. Scored, damaged or burned-out bearings, costly repairs, idle machinery waiting for repair parts must have no part in today's vital need of more and more production.

Proper lubrication will keep this vandal "friction" out of your plant . . . lubrication that provides a tough load-bearing, long lasting film between all shafts and bearings, gears, chains and other contacting machine parts. LUBRIPLATE lubricants will do it. LUBRIPLATE is in a class by itself. It possesses properties not found in conventional lubricants.

Don't take our word as to the efficiency of LUBRIPLATE. Read this letter from one of the best known manufacturers of metal products in this country:

> "As you know, our machinery is of the high speed type, and with the constant increasing of the speed of these machines, lubrication has presented itself to be one of our biggest problems to solve before we can increase speed to a much greater extent. The results of our experience with LUBRIPLATE have been very gratifying as it has caused our machines to run much cooler, and the fact that LUBRIPLATE stays put and lasts longer, it has minimized our lubricating costs. LUBRIPLATE has done all you have claimed it to do."

With such conclusive evidence, don't you think it's your patriotic duty to investigate LUBRIPLATE? Our staff of engineers and dealers everywhere are at your service. Write, phone or wire today.

LUBRIPLATE DIVISION
FISKE BROTHERS REFINING COMPANY
SINCE 1870
NEWARK, N. J. TOLEDO, O.

DEALERS FROM COAST TO COAST

LUBRIPLATE
ARRESTS PROGRESSIVE WEAR

PMCO

WELDED DIPPERS

have established a new basis for shovel capacity

2-YD. PMCO WELDED DIPPER
Sizes ⅜ Yd. to 30 Yd.
Payload increases as dead weight decreases—
Welded construction eliminates dead weight.

CONSULT your shovel engineer about the added capacity PMCO speed dipper for your shovel. New shovels are now engineered for increased capacity with PMCO welded dippers by leading shovel manufacturers.

REPRESENTATIVE USERS OF PMCO SPEED DIPPERS:

Link-Belt Speeder
Thew-Lorain
Koehring
Harnischfeger Corp.
Butler Brothers
The M. A. Hanna Co.
Lima Locomotive Works
Ayreshire Patoka Collieries
Oliver Iron Mining Co.
Pickands, Mather & Co.
Manitowoc Engineering Works

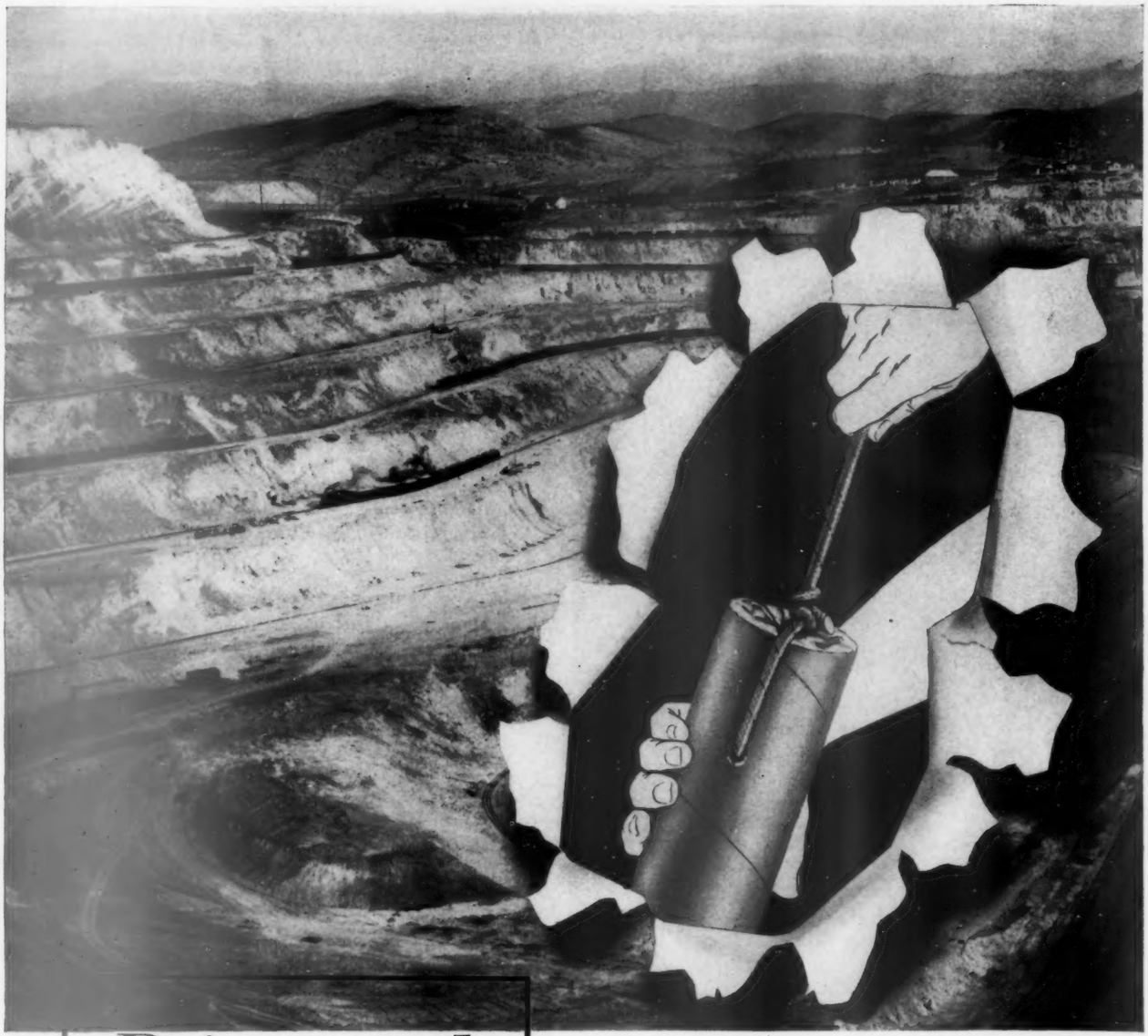
Check these figures

PMCO WELDED DIPPER / SOLID CAST DIPPER	EMPTY DIPPER WEIGHT	LOADED DIPPER WEIGHT	NET PAY-LOAD*	INCREASE OF PAYLOAD	INCREASE PER-CENTAGE
⅝ yd.	1350	3035	1685	337	25%
replaces ½ yd.	1600	2950	1350		
¾ yd.	1700	3725	2025	337	20%
replaces ⅝ yd.	1900	3590	1690		
⅞ yd.	1900	4250	2350	337	16⅔%
replaces ¾ yd.	2450	4475	2025		
1 yd.	2100	4800	2700	675	33⅓%
replaces ¾ yd.	2450	4475	2025		
1¼ yd.	2600	5975	3375	675	25%
replaces 1 yd.	3250	5950	2700		
1½ yd.	3100	7150	4050	675	20%
replaces 1¼ yd.	3800	7175	3375		
1¾ yd.	3700	8425	4725	675	16⅔%
replaces 1½ yd.	4250	8300	4050		
2 yd.	4100	9500	5400	675	14⅓%
replaces 1¾ yd.	4700	9475	4725		
2¼ yd.	4450	10525	6075	675	12½%
replaces 2 yd.	5500	10900	5400		
2½ yd.	5000	11750	6750	675	11%
replaces 2¼ yd.	6000	12075	6075		
3 yd.	6200	14300	8100	1350	20%
replaces 2½ yd.	7500	14250	6750		
3½ yd.	8000	17450	9450	1350	16⅔%
replaces 3 yd.	9000	17100	8100		
4 yd.	9850	20650	10800	1350	14%
replaces 3½ yd.	10500	19950	9450		
4½ yd.	10500	22650	12150	1350	12½%
replaces 4 yd.	13500	24300	10800		
4¾ yd.	11500	24325	12825	2025	20%
replaces 4 yd.	13500	24300	10800		
5 yd.	12500	26000	13500	1350	11%
replaces 4½ yd.	15000	27150	12150		
6 yd.	15000	31200	16200	2700	20%
replaces 5 yd.	17500	31000	13500		

*Figuring payload at 2700 lbs. per yd.

We operate the largest and most complete manganese steel foundry in the United States

PETTIBONE MULLIKEN CORPORATION
Established 1880
4710 West Division Street, Chicago, Illinois



Primacord acts as the Detonator

Notice that the end of the Primacord-Bickford Detonating Fuse has been passed through the hole in the cartridge and secured with a simple knot.

The cartridge is now ready to be lowered to the bottom of the drill hole. No cap is needed in the load, for Primacord-Bickford will detonate this cartridge—and *every* cartridge in the hole.

This is but one of the ways in which the use of Primacord is simplifying blasting operations in quarries, open pit mines, and on construction work. Its use has a number of other advantages for you—which are all explained in the Primacord Booklet—*free.*

THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONN.

Manufacturers of Safety Fuse since 1836

PB-43

PRIMACORD-BICKFORD DETONATING FUSE

PRESSURE is on the country! Pressure is on us—on you! Every machine that can be turned out tomorrow was needed yesterday. Under such conditions the most minor delay is costly beyond that of ordinary times. More than ever, features of design and operation that can give you an advantage in output or in reduced maintenance count toward getting the job done.

Northwests are *proved* rock shovels—proved on some of the stiffest mining and quarry jobs throughout the country.

Such features as the Northwest Dual Independent Crowd that utilizes force other shovels waste, the Northwest Shovel Boom (and no shovel boom of Northwest design built since 1932 has ever failed), the Cushion Clutch, the "feather-touch" Clutch Control, Differential Steering and other Northwest advantages fit it to the heavy work of mining. *Northwests stay on the job!*

Today calls for dependability. Tomorrow's mining will require economy. Northwest advantages provide an answer to both. Plan now to look into Northwest design and construction. Let us send you complete details.

NORTHWEST ENGINEERING CO.
1822 Steger Building
28 East Jackson Boulevard • Chicago, Illinois

IF IT'S A REAL ROCK SHOVEL, YOU'LL NEVER HAVE TO WORRY ABOUT OUTPUT IN ANY DIGGING!

NORTHWEST

Serving the WAR EFFORT *with* GREATER PRODUCTION

SYMONS Cones are doing their part in increasing the production of our many strategic materials, particularly those metals and industrial minerals in which fine reduction crushing operations are involved.

In addition to regularly established stone, gravel and slag plants, Cones are also serving many newly built projects which are providing great quantities of materials quickly needed for ammunition plants, cantonments, storage facilities, docks, flying fields, air and naval bases, etc. Where quantity output of finely crushed material is desired, you can depend on Symons Cones to make a better product at lower cost.

NORDBERG MFG. CO.
MILWAUKEE WISCONSIN

NEW YORK · LOS ANGELES · LONDON · TORONTO

SYMONS CONE CRUSHERS

FOR THE UNHAMPERED MOVEMENT OF MEN AND MATERIALS

With the Nation's resources mobilized for the efficient, all-out prosecution of the war, the country's vast network of highways takes on a new significance. It is on them that the speedy movement of men and materials depends.

Practically every important highway in the United States has felt the influence of MARION equipment. But no more so than the Nation's quarries, responsible for the aggregates with which these highways are built. Today MARION'S dependable performance is being utilized by hundreds of quarry operators in an all-out "blitz" against TIME in digging and loading basic road building materials so more and more highways can be built. In this way, MARIONS are bringing defeat closer to the enemies of democracy.

THE MARION STEAM SHOVEL COMPANY
MARION, OHIO, U. S. A.

Offices in all principal cities
Serving industry since 1884

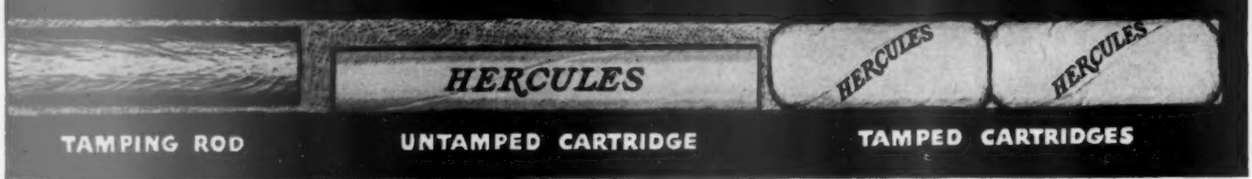
MARION

SHOVELS • DRAGLINES • CLAMSHELLS
CRANES • PULL-SHOVELS • WALKERS

Gasoline — Diesel — Electric — ¾ cubic yard to 35 cubic yards

Announcing TAMPTITE

THE NEW HERCULES CARTRIDGE WRAPPING



TAMPING ROD | UNTAMPED CARTRIDGE | TAMPED CARTRIDGES

A QUICK LOOK AT TAMPTITE IN ACTION!
The regular-size cartridge goes in the bore hole. Note the space to be filled.
Pressure from the tamping rod compresses the powder to fill the space.
Another cartridge goes in—Compaction takes place *inside* the wrapper.
The charge is concentrated for better blasting results.

faster loading . . . better breakage . . .

Have you seen miners slit cartridges of dynamite to make them fit tightly in the bore hole? That's just one of many ways that explosives men have tried for years to lick the problem of concentrating charges for hard rock blasting.

Tamptite really does the job. This unique Hercules development lets the charge be compressed *inside* the wrapper. This means no spillage of powder in the bore hole—just the thing for loading uppers.

It's such a simple, quick way to concentrate the charge that we believe its adoption is inevitable in tunneling, metal mining; in fact, wherever good breakage of rock is needed.

HERCULES POWDER COMPANY
INCORPORATED
960 KING STREET • WILMINGTON • DELAWARE
A-83

Your wire rope will last longer with *Proper Lubrication*

WIRE rope, like a lot of other things, is going to be harder and harder to get. If your equipment is to keep on working, you must take every care to make your wire rope last as long as possible. It's good sense at anytime. Right now, it's a patriotic duty.

Every American Tiger Brand Wire Rope comes to you from the factory properly lubricated and ready for service, but factory lubrication, no matter how efficient, will not last the life of a rope. Field lubrication is absolutely essential.

Because it is such an effective deterrent to corrosion, proper lubrication at regular intervals is perhaps the most important aid to longer rope life and increased operating efficiency. So don't neglect it. Proper lubrication protects both inside and outside wires against destructive rusting. It keeps all wires free to slide on each other, as they must do when the rope bends over sheaves and drums. It minimizes friction and wear between individual wires and also between the rope and the sheaves or guide through which it passes. It is the safest, surest method of preventing excessive wear inside the rope where it is most dangerous because you can't see it.

Remember — every wire rope allowed to wear out prematurely through neglect or improper use is an unnecessary loss to the nation.

Excellay *Preformed*

THIS FREE BOOK TELLS HOW . . . SEND FOR IT

Every phase of wire rope care and handling is detailed in this 48-page, illustrated booklet. Follow the boiled-down experiences of thousands of rope users and you will be surprised how much better your wire rope will perform and how much longer it will last.

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
COLUMBIA STEEL COMPANY
San Francisco
United States Steel Export Company, New York

USS

UNITED STATES STEEL

Idle Time is *Sabotage!* On the Job

SAVE TIME

with

HAULING

DEMPSTER DUMPSTER BuckeTrux

DUMPING

LOADING

LIQUIDATE obsolete working methods—costly "stand-by time" that causes waste and loss.

CONCENTRATE man-power and machine-power in all hand-loading operations by employing DEMPSTER-DUMPSTER—the master unit for hauling all materials.

COOPERATE with our national program that demands the ultimate in productive speed and capacity—enlist DEMPSTER-DUMPSTERS for your job!

Write for Information

DEMPSTER BROS., INC., KNOXVILLE, TENNESSEE

Maybe our photographer's ladder will illustrate the point

NOW and then some engineering-minded citizen makes wise cracks about this ladder in our photographer's studio. Its history is easy to guess: The photographer once owned a ladder that caved in under his 189 pounds. So he became an extremist and built this ladder that an engineer's committee rates capable of supporting all the good photographers in the Central States.

Well . . . the theory was all right. It's better to err on the safe side than on the dangerous side—and that goes for both ladders and pipe. But after all, there is no reason to run a good theory into the ground! So just ask yourself whether this ladder is any more out of key with its particular purpose than a lot of pipe is out of key with many of the services for which it is commonly used.

Ten-inch standard weight pipe, for example, has a rated bursting strength of about 3000 lbs. per sq. in. Yet you see it widely used for carrying water, gas, air, exhaust steam—handling jobs that are "naturals" for light wall, but remarkably strong Taylor Spiral Pipe.

Understand that we are not trying to make Taylor Spiral Pipe a panacea for all piping ills. We simply say that within its service range it fulfills a vital need supremely well. Its reinforcing spiral seam gives it greater strength pound for pound and gauge for gauge than even a seamless pipe. With superfluous weight eliminated, it cuts installed cost in many cases to no more than half that of standard weight pipe.

Some suggested uses and general specifications are given opposite and below. Discover its effectiveness and economy on that next job.

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- ▶ High and Low Pressure Water Lines.
- ▶ Low Pressure Steam and Air Lines.
- ▶ Steam and Diesel Exhaust Lines.
- ▶ Vacuum and Suction Lines.
- ▶ Blower Piping.
- ▶ Sand and Gravel Lines.
- ▶ Industrial Gas Lines.
- ▶ Oil and Gas Gathering Lines.
- ▶ Swing Pipe.
- ▶ Spray Pond Piping.
- ▶ Hydraulic Mining.
- ▶ Dredge Lines.

● Sizes of Taylor Spiral Pipe range from 4" to 42"; thicknesses from 18 gauge to 6 gauge; joint lengths up to 40 feet. All types of end joints and couplings; all kinds of fittings and specials or fabricated assemblies are produced by Taylor Forge, thus assuring complete service and undivided responsibility.

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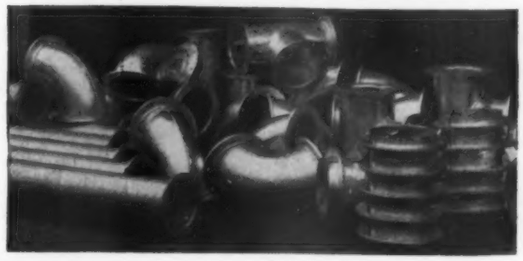

● With these Taylor Light Wall Fittings it's easy to make a trim workmanlike job. Special factory-made fabrications are also available.

TAYLOR *Spiral* PIPE

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That's What the Simpson Brothers, Owners of Rose City Sand & Gravel Co., Say About Their Allis-Chalmers No. 322 Type "R" Crusher! Read All the Facts About This Remarkable Crusher that Costs Less than Any Comparable Machine on the Market Today!

Tramp iron? If that's been a source of interrupted production in your plant, here's the way one operator licks his problem of shutdown time . . . with an Allis-Chalmers Type "R" Crusher!

At Rose City Sand & Gravel Co., Portland, Ore., the Simpson brothers produce 25 yards per hour of minus ½" rock. The gravel comes from a large open pit, contains considerable tramp iron, which gets into the crusher several times a day.

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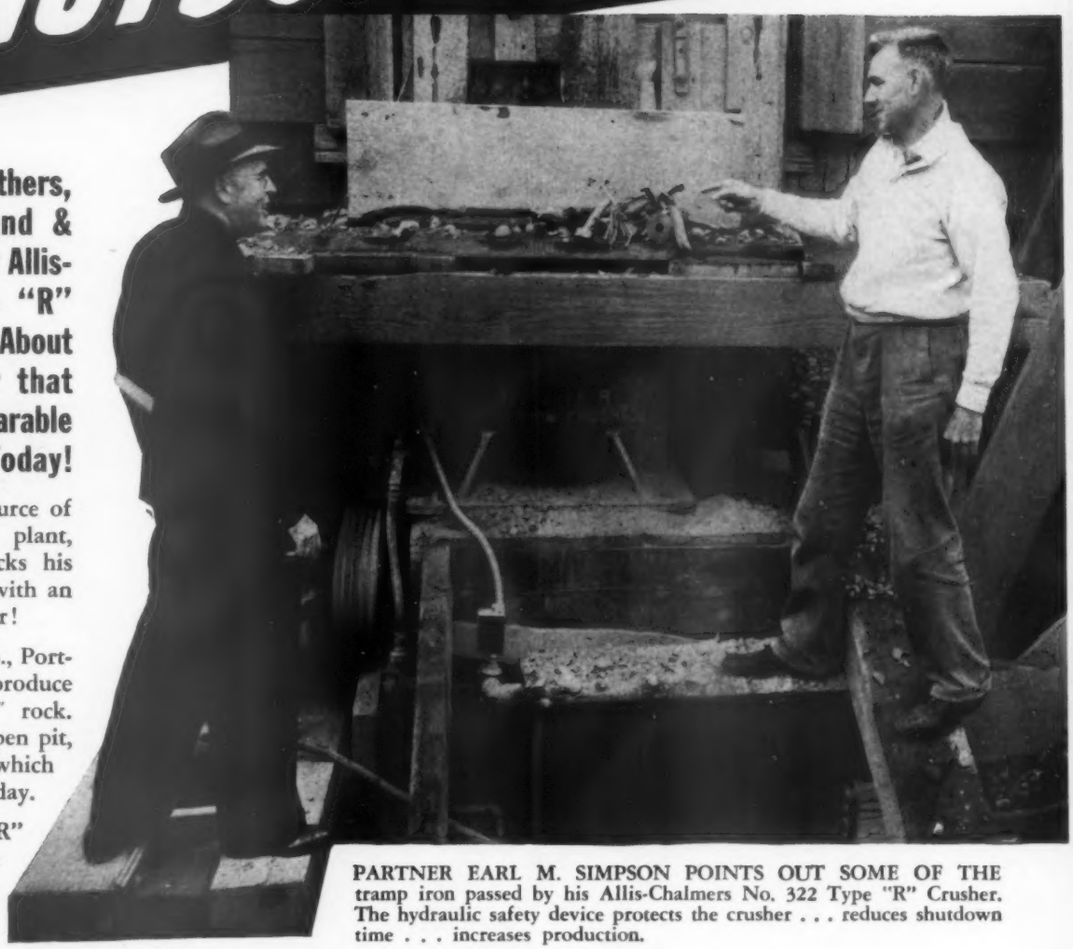

PARTNER EARL M. SIMPSON POINTS OUT SOME OF THE tramp iron passed by his Allis-Chalmers No. 322 Type "R" Crusher. The hydraulic safety device protects the crusher . . . reduces shutdown time . . . increases production.

That's why partner John M. Simpson writes, "This safety device alone saves us at least $100.00 per month in shutdown time and possible repairs. Our Type "R" produces more cube rock and less dust than the ordinary reduction crusher . . . and we now make considerably more Oregon and Washington state specification oil rock."

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Atlas Manasite is the result of years of experience in making blasting caps. Before Manasite was introduced, Atlas made hundreds of millions of detonators—good detonators, as reliable and as relatively safe as any produced at the time. Then, through chemical research, Atlas changed the blasting-cap picture. With Manasite, an exclusive method of manufacture—plus the use of hexanitromannite as a detonating agent—substantially increased the margin of safety. While no blasting cap can be called "safe," Atlas Manasite Detonators make safety precautions more effective than ever.

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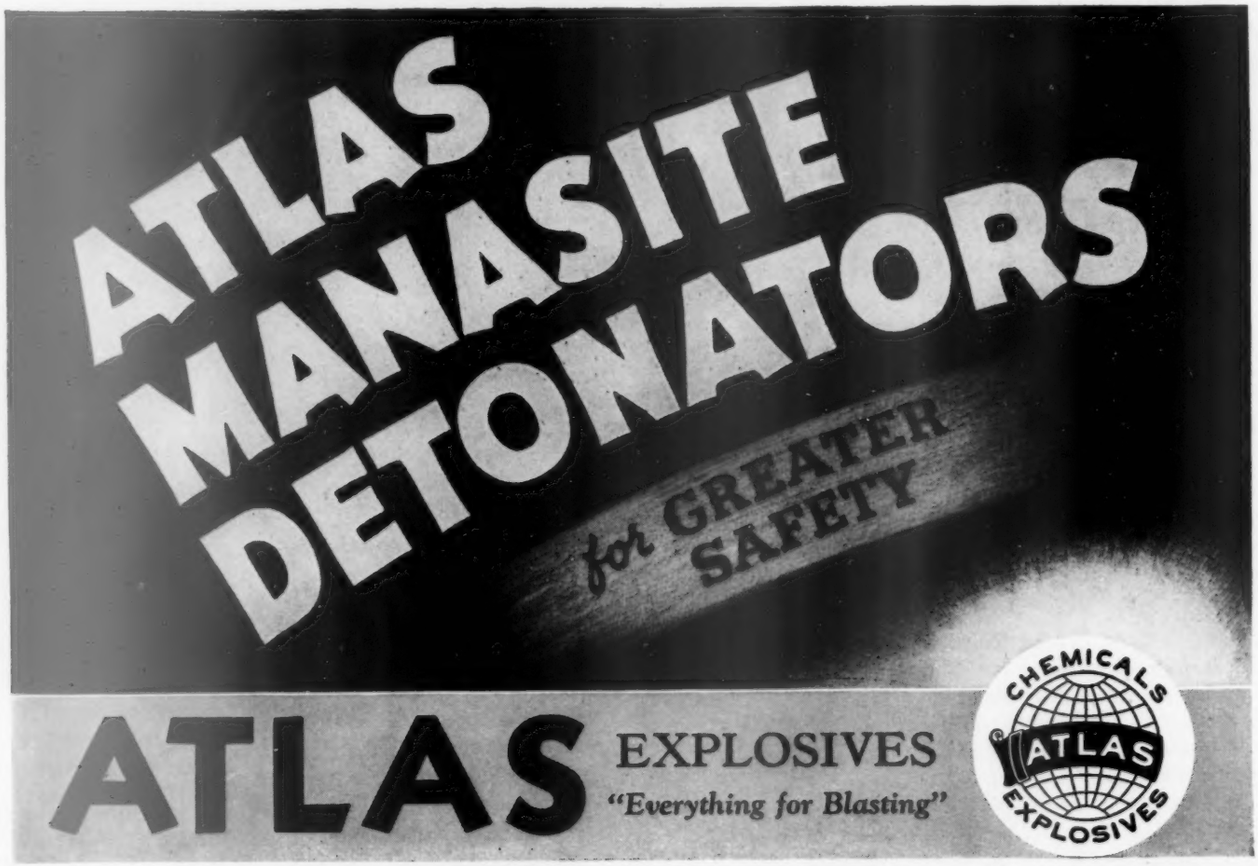

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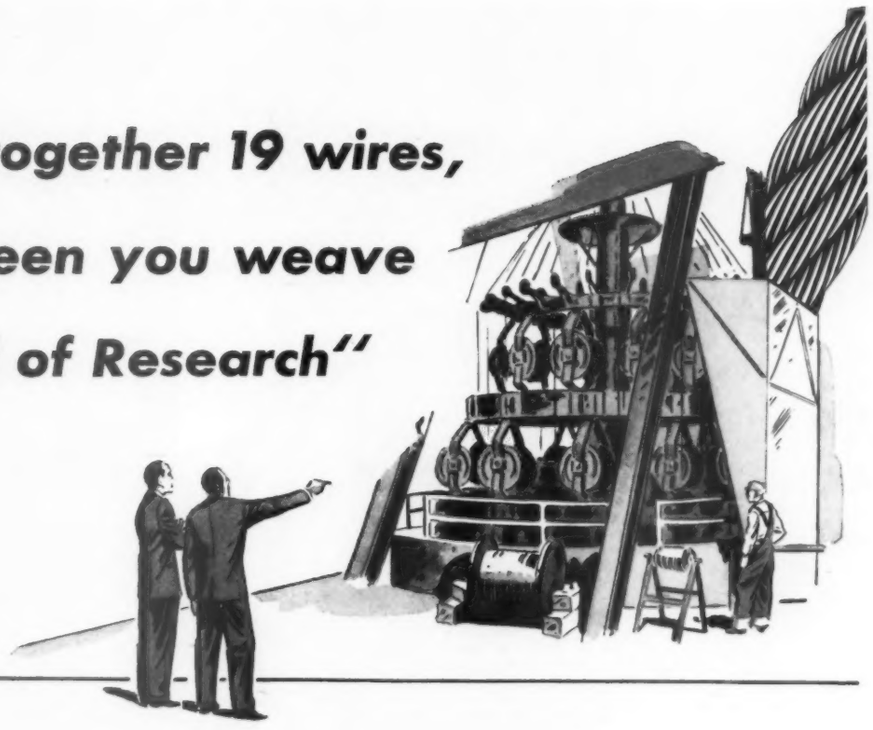
"You strand together 19 wires, and in between you weave the thread of Research"



Like the research that's responsible for this giant strander

"Many a job calls for 6 x 19 "Blue Center" Steel Wire Rope, but for those that don't, Roebling Research is ready with specialized facilities and materials. This giant strander, for example, can take as many as 46 tough steel wires, and accurately lay them into strand for pliable, high-strength, large diameter ropes, such as are used on mammoth dredges . . .

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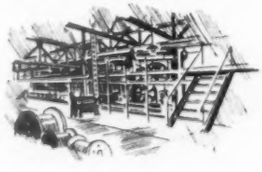

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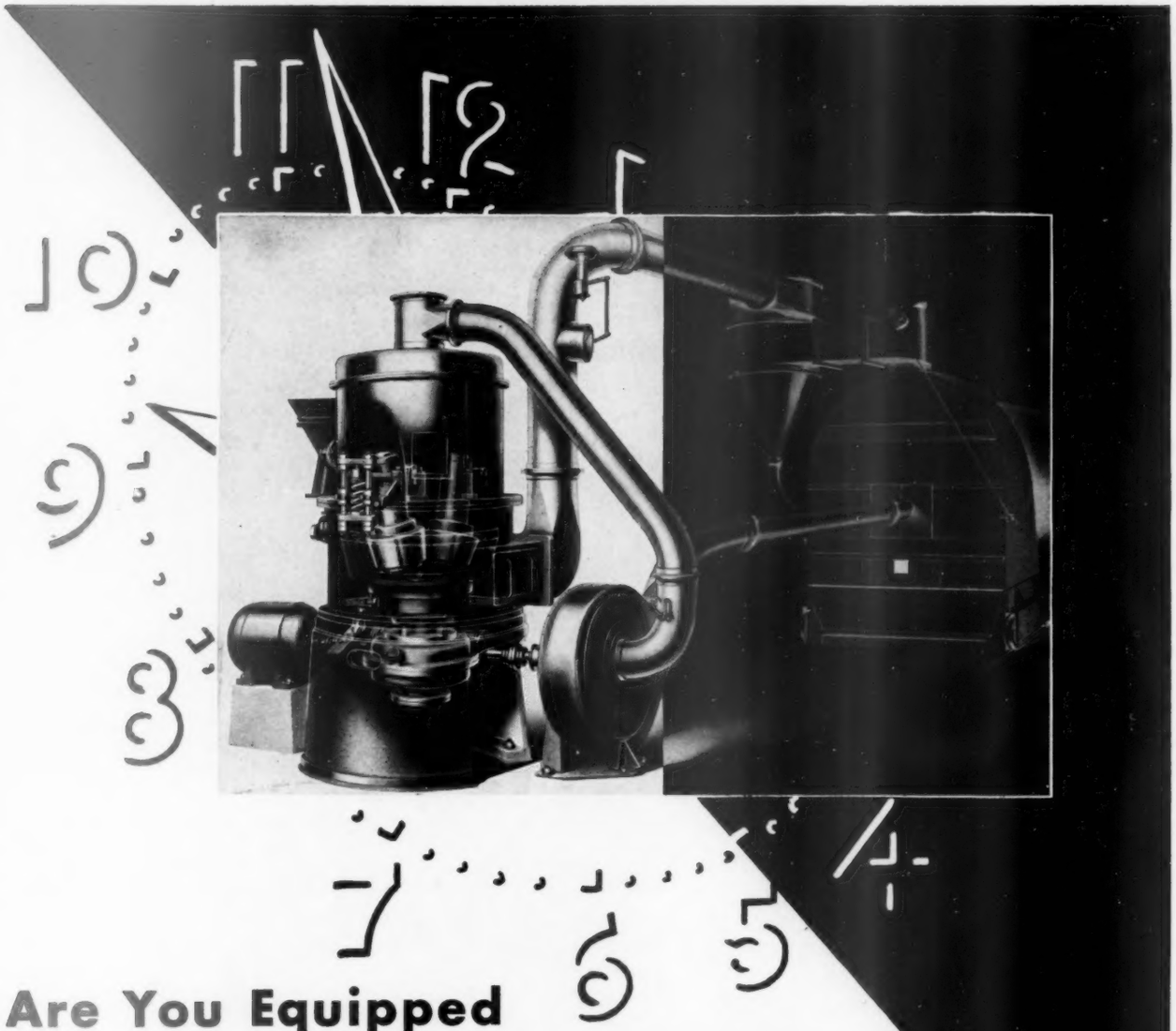

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BOWL MILL

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APR 14 1942

PIT AND QUARRY

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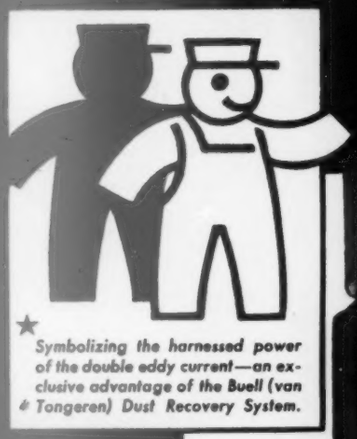
"Double Eddy" ★ says:

The buyer wanted to know how much dust this collector would recover



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Installation of Buell Collectors in plant of nationally-known food products manufacturer

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Buell's "fractional efficiency" guarantees are famous for their accuracy. Briefly, they are guarantees to collect a definite percentage of the dust particles of each size—a guarantee that holds regardless of the inevitable and continual changes in particle size distribution that make it impossible ever to give an unqualified overall efficiency guarantee. Buell's guarantees are conservative and actual performance usually betters the guarantee.

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Particle* Size in Microns	Guaranteed to Collect	Actual Collection
0 to 10	61%	63.2%
10 to 20	92%	92.6%
20 to 30	98%	98.5%
30 to 43	99%	99.4%
plus 43	99.5%	99.8%

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DUST RECOVERY SYSTEMS

National Gypsum to Build and Operate Arms Plant in Texas

The National Gypsum Company, Buffalo, has announced that it has entered into a contract with the United States Government to supervise construction of and to manage a munitions plant "somewhere in Texas." The project will be known as the Bluebonnet Ordnance Plant and will cost "several million dollars."

The plant will occupy a large tract of land and will require the building of an entire community, including utilities and living quarters for several thousand workers, President Melvin H. Baker said. The gypsum company will act as consultant in construction, will purchase all necessary equipment and will manage the operation of the plant thereafter "just as any other company property."

Several key men from the present organization have been assigned to full-time positions on the new project. Lewis R. Sanderson, superintendent of the company's New York City plant, will be general manager. Walter S. Corrie, company comptroller, Buffalo, will be comptroller of the new plant. Dudley C. Chads, superintendent of the company's Medicine Lodge, Kansas plant will be production manager.

Sues for $10,503 Over Rejection of Gravel

The White Hill Sand & Gravel Company, of Salt Lake City, through its president, Gordon Taylor Hyde, chairman of the Utah Finance Commission, has filed suit against Broderick & Gordon, contract builders of the Salt Lake Ordnance Plant, seeking damages of $10,503 for losses allegedly incurred by the gravel company when the contractor refused to accept gravel deliveries.

The gravel company contends in its complaint that on August 6, 1941, it entered into a contract with Broderick & Gordon for the delivery of 210,000 cubic yards of gravel at 65 cents per cubic yard. The gravel firm delivered 114,518 cubic yards, but the contracting firm refused to allow delivery of the remaining 95,482 cubic yards, according to the complaint, which further alleges that the difference between the contract price of the gravel, 65 cents, and the cost of producing and delivering it was 11 cents a cubic yard.

Mr. Hyde contends that his firm therefore lost profits totaling $10,503 when Broderick & Gordon refused to accept delivery of the gravel, and asks damages of that amount plus costs and interest.

All Employees Sign Up to Buy Defense Bonds

Two Alpena plants—the Thunder Bay Quarries Company and the Huron Portland Cement Company—have received charters in the 100 Per Cent Defense Savings Club of Alpena.

All workers in the plants have signed to purchase defense bonds by the payroll allotment plan.

Coming Events

April 18-24, 1942—Cleveland. First Western Hemisphere Foundry Congress, Cleveland Auditorium.

May 26-28, 1942—Hot Springs, Virginia. Annual convention, National Lime Association, The Homestead.

June 9-11, 1942 — Cleveland. Annual convention, National Concrete Burial Vault Association, Hotel Cleveland.

June 22-26, 1942 — Atlantic City. Annual convention, American Society for Testing Materials.

Seeks Priorities on Materials to Erect State Cement Plant

W. P. Jacobs of Clinton, South Carolina, chairman of the state's defense council was recently in Washington to seek priority ratings for materials to construct a $3,000,000 cement plant in South Carolina, according to press reports.

Mr. Jacobs said the plant would be built by private capital and financial backers were now awaiting the "go ahead" signal from Washington which is expected shortly.

The proposed plant would be built in the Webb's Creek section of Orangeburg County, he said.

Speaking at a meeting of the state defense council, the chairman reported that more than 5,000,000 barrels of cement were needed for defense construction in the area served by the port of Charleston. He pointed out there was not a cement plant in North or South Carolina.

In Washington, Mr. Jacobs is said to have conferred with Senator Burnet R. Maybank on the advisability of obtaining priority ratings for the cement plant.

Two Denied Damages in Silicosis Litigation

After deliberating 45 minutes, a Supreme Court jury at Batavia, New York, returned a verdict of "no cause of action" in the $100,000 silicosis suit brought by two former workmen against the United States Gypsum Company. The plaintiffs, Antonio George and Frank Guiliano, had sought $50,000 each.

The defense rested its case after Dr. Homer Sampson, X-ray specialist of Saranac Lake, testified that his examination disclosed that neither man had suffered any ill effects from working in the company's gypsum mines. Testimony opened February 9 with physicians as most of the witnesses for both sides.

Gypsum Products in Strong Demand During Final 1941 Quarter

The strong demand for gypsum products continued through the fourth quarter of 1941 during which sales volumes of nearly all products surpassed those of the similar period of 1940. Striking gains in both physical volume and proportion were recorded for sales of cement retarder, lath and wallboard. For the four quarters of 1941, aggregate consumption of gypsum products as indicated by sales reports to the Bureau of Mines was considerably higher than in 1940 and was approximately at the advanced rate attained during the peak years of the industry in 1925-26.

Over-all improvement of activity during the October-December period of 1941 over the same period of 1940 may be measured by the respective gains of 32 and 23 per cent. in tonnage of domestic crude mined and calcined gypsum produced. Tonnage gains for the entire year over 1940 were of similar proportions. It is noteworthy that output of crude from domestic operations in the fourth quarter increased contraseasonally over output in the third quarter of 1941. Also, production of calcined gypsum remained over 1,000,000 tons for the third successive quarterly period and showed a much less than seasonal decline from output in the July-September period of 1941.

Sales of gypsum to the Portland-cement industry for retarder use increased markedly during 1941 and were respectively one-third and one-half greater in the fourth quarter and yearly totals than similar data for 1940. Annual total sales of this product in 1941 closely approached those in the years of record consumption during the middle and late 1920's.

Admixture for Cement Now Royalty-Free

The series of steps leading to the elimination of scaling of concrete highways from freezing and thawing has finally been completed through the dedication to public use by The Hercules Powder Company of the patents covering the use of "Vinsol" resin in cement, the company has announced.

The resin is used in cement to reduce surface scale and almost completely eliminate progressive scale, the company says. Laboratory and field tests have determined that additions of extremely small quantities of "Vinsol," in the range of .03 to .05 of 1 per cent. to highway cements would produce concrete highly resistant to frost action.

Through the coöperation of the Portland Cement Association and highway boards of many states, field test data have been developed which have led many cement manufacturers to adopt the resin for their cements.

Vinsol resin, a pine-wood derivative, has been generally adopted because it can be incorporated in the cement at a cost of a fraction of a cent a barrel of cement. The action of the company will make it possible for cement manufacturers to make the material an ingredient of their cements without payment of royalties.

EMPLOYMENT AND PAY-ROLLS

(Compiled for PIT AND QUARRY by Isador Lubin, Commissioner of Labor Statistics, U. S Dept. of Labor.)

Industry	Es ablish-ments	Number of Employee-	Pay Rolls (1 week)
Cement:			
November, 1941	135	24,277	$758,386
December, 1941	135	23,761	743,044
Percentage change		—2.1	—2.0
Quarrying and nonmetallic mining:			
November, 1941	931	32,715	$889,307
December, 1941	931	31,606	865,829
Percentage change		—3.4	—2.6

New York Operators Honored for Safety

Quarrying and related concerns were prominently represented among those honored for distinctive records in the 17th annual statewide accident-prevention campaign of the Associated Industries of New York State, which closed recently.

Entries in the stone-products group winning merit certificates for operating with a 100-per cent. clean record of no lost-time accidents during the campaign period were: Lehigh Portland Cement Company, Buffalo; Lehigh Portland Cement Company, Alsen; Lone Star Cement Corporation, Hudson; North American Cement Corporation, Catskill; National Gypsum Company, Clarence Center; Universal Atlas Cement Company, Hudson; Glens Falls Portland Cement Company, Glens Falls; New York Trap Rock Corporation, Verplanck and Tomkins Cove.

Quarry Buying Scrap to Aid War Effort

The Ladd Lime & Stone Company, Cartersville, Georgia, is acting as a scrap-iron clearing-house in its immediate area to aid in the defense effort. The idea originated with Col. W. H. McNaughton, president, was widely publicized in the local press and results have been excellent.

During the first two weeks of the campaign in February 110 tons of scrap were delivered to the quarry, weighed, and paid for in cash at the rate of $14 per ton. The Ladd concern loads and ships the scrap without profit.

Cement Production Rises 37 Per Cent. Ahead of Last Year

The Portland-cement industry in January, 1942, produced 12,429,000 barrels, shipped 9,120,000 barrels from the mills, and had in stock at the end of the month 23,245,000 barrels of cement, according to the Bureau of Mines.

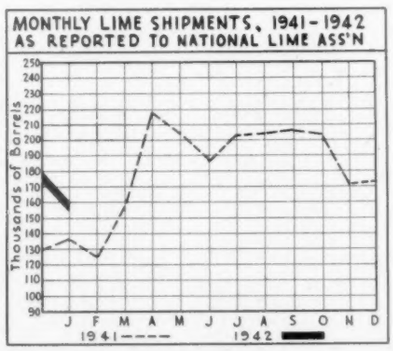
Production and shipments in January, 1942, showed increases of 37.8 and 14.2 per cent., respectively, as compared with January, 1941. Portland-cement stocks at mills were 4.8 per cent. lower than a year ago.

The factory value of the shipments from the mills in 1941 — 167,508,000 barrels—is estimated at $247,449,000, representing an average value of $1.48 per barrel. According to the reports of producers the shipments totals for 1941 include approximately 6,083,000 barrels of high-early-strength cement with an estimated mill value of $11,411,000.

Offers Free Sand to Extinguish Bomb Fires

Ten thousand cubic yards of sand has been offered free to Placer County, California, for use as a defense against incendiary bombs, by the Pacific Portland Cement Company.

J. H. Colton, vice-president in charge of operations, sent a letter to the County board of supervisors, stating that they were free to haul that amount from the company's property.



According to data collected by the National Lime Association, 71 companies in January, 1942, shipped 154,744 tons of lime (111,090 quicklime; 43,654 hydrate). Reporting companies represent 47.6 per cent. of the association's total capacity of record. Based on PIT AND QUARRY'S estimates for the remainder of the industry, the total shipments for the month by all plants were approximately 385,000 tons. Shipments of lime by users for January, 1942, were:

Use	Quick-lime (tons)	Hy-drate (tons)
Agricultural	322	3,830
Building	14,898	18,531
Chemical	95,870	21,293
Total	111,090	43,654

Road Builders Told How War Work Will Affect Construction

The annual meeting of the American Road Builders Association, held at Memphis, March 2-5, had its main interest centered on the effect of war restrictions on the highway industry. That these restrictions would cut drastically into roadbuilding operations was accepted as inevitable without complaint. The major concern, however, was the possibility that lack of knowledge of how the restrictions are to be applied would keep the highway builders from contributing most effectively to the war effort. This spirit found expression in a resolution, adopted by the directors at the close of the meeting, pledging the association to do its utmost to aid the President and the armed forces to win the war decisively and quickly.

The need for efficient functioning of highway transport during the present emergency was stressed by Hal G. Sours, president of the A.R.B.A. in opening the convention. Both at the opening session and at the "victory banquet" Mr. Sours laid special emphasis on the importance of maintaining the present federal-aid system of highway building, pointing to the many benefits that have grown out of the nationwide planning of highway development that was set up following passage of the first federal-aid highway act. He noted that normal federal contributions would be drastically cut during the war but said that this should not be made a justification for dropping the system.

Chris J. Sherlock, until recently director of the Alabama Highway Department, was elected president of the association. New vice-presidents are: Paul B. Reinhold, president, Reinhold & Company, Pittsburgh; Charles W. Smith, president, Smith Engineering & Construction Company, Pensacola; Lion Gardiner, vice-president, Jaeger Machine Company, Columbus; and Robert A. Allen, state highway engineer, Nevada. H. C. Whitehurst, director of highways in the District of Columbia, was elected treasurer.

Production of Sulphur Breaks Former Record

Production of crude sulphur in the United States in 1941 attained a new record of 3,139,253 long tons, a 15-per cent. gain over the 1940 output of 2,732,088 tons, according to the Bureau of Mines. Mine shipments increased by one third and were also the largest on record—3,401,410 long tons valued at $54,400,000 in 1941 compared with 2,558,742 tons valued at $40,900,000 in 1940. Stocks of sulphur at the mines decreased from 4,200.000 long tons at the beginning of 1941 to a year-end quantity of 3,900,000 tons, which is still more than a year's supply at the current rate of consumption. Production of sulphur was reported from California, Louisiana, and Texas.

Erie Concrete Supply Gets Naval Contract

The Navy Department has awarded a $1,250,000 contract to the Erie Concrete Supply Company, Erie, Pennsylvania, for four new lighters. The company is building seven boats for the Navy including the four new ones. The contract for the four lighters calls for their completion before the close of navigation this year.

Report Progress on Long-Time Study of Cement Performance

In 1940 a committee of twelve headed by P. H. Bates of the National Bureau of Standards and sponsored by the Portland Cement Association, was established to conduct an extended experimental study of cement performance in concrete structures under varying conditions of service. The main purposes are to determine the extent to which the performance of concrete is affected by differences in the cement, and to determine the factors responsible for such differences. The cements selected for study are the five standard types covered by recent American Society for Testing Materials specifications and another group to include specially treated cements such as those ground with tallow, vinsol resin, and other reactive agents. Specially prepared concretes are employed in structures exposed to loading, weathering, and other conditions that may be encountered, and careful observations are made at intervals.

Considerable progress has been made since the program of studies was adopted in August, 1940. Work on an experimental farm at Naperville, Illinois, has been substantially completed, and identical specimens are now being fabricated on a similar farm near Perry, Georgia. Two road projects have been completed, one in Missouri and one in South Carolina. Specimens for seawater exposure on the north Atlantic coast have been completed and installed in the east mooring basin of the Cape Cod ship canal. A parallel series of specimens has been cast and will shortly be placed in sea water near St. Augustine, Florida.

Picture taken at the "Victory banquet" of the American Road Builders' Association at Memphis during the annual convention.

U. S. Gypsum Plants Working at Capacity to Fill War Orders

Plants of United States Gypsum Company are currently operating at capacity supplying building materials for War and Navy department projects and for defense housing, Sewell L. Avery, chairman of the board, reported at the annual meeting of stockholders, held March 4 at Chicago.

So far as can be seen at present there will be sufficient business to maintain present activity at least for the first six months of this year, Mr. Avery explained.

"Thereafter the level of demand will be determined mainly by the volume of further construction for war purposes," he said.

The company has lost through sinking one of its four ships which carry gypsum from Nova Scotia to the east coast of the United States, he said. The boats are under English registry. The company has deposits of gypsum in the East which could supply a part of the requirements in that area should offshore supplies be further curtailed.

Commenting on last year's business, Mr. Avery pointed out that the company's products sold at lower prices and that there has been no increase in selling prices in about four years.

"Our costs were higher and our prices were lower," he said. "With volume we made a good showing. The company in 1941 paid overtime wages totaling $460,000. Production costs in 1941 increased an average of 4 per cent. in comparison with 1940."

Directors elected William L. Keady president of the company. Mr. Keady was formerly vice-president in charge of sales. O. M. Knode, former president, was elected chairman of the executive committee, in which capacity he will continue to occupy an active executive position. H. F. Sadler, formerly general sales manager, was elected vice-president in charge of sales.

Building Contracts Up 30 Per Cent. This Year

Acceleration of the war construction program resulted in an increased volume of building and engineering contracts in the month of February, according to the F. W. Dodge Corporation.

Total contracts awarded in February in the 37 eastern states amounted to $433,557,000, compared with $316,846,000 in January and $270,373,000 in February, 1941. The accumulated dollar volume of contracts let during the first two months of this year is 30 per cent. greater than the figure for the corresponding period of 1941. In spite of this substantial increase, the augmented program has scarcely gotten into full stride. Contract totals for these 37 states averaged over $500,000,000 a month during 1941, and this year's program is expected to top that of last year.

Last month's contracts, in comparison with those of February 1941, showed the following dollar volume increases: heavy engineering construction, up 6 per cent.; non-residential building, up 38 per cent.; residential building, up 62 per cent.

Explosives Users Must Have Federal License

Renewing his warning that general emergency explosives licenses expired "at the close of business" on Monday, March 16, 1942, Dr. R. R. Sayers, director of the Bureau of Mines, states that all persons and corporations that have not obtained new Federal licenses to manufacture, distribute, store, sell or use nonmilitary explosives or their ingredients are violating the law.

Since March 16, any person or firm using explosives or ingredients of explosives without a license is subject to imprisonment for not more than one year, or a fine not exceeding $5,000, or both fine and imprisonment.

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31 of 35 Lime Plants Operate Accident-Free

A new service of the National Lime Association, which comprises the collection and dissemination of monthly accident experience data on lime plants enrolled in the annual safety competition, has met with very favorable response, according to Roma F. Medford, assistant secretary.

Of the 35 plants reporting for January, 31 had perfect records of no accidents and no time lost. Several additional plant reports were received too late to be included in the January summary, but they will be added to those reporting in February.

Preferred stockholders of National Gypsum Company have approved the issuance by the company of $1,000,000 of 3-per cent. debentures. Proceeds from the debentures, to be sold privately to insurance companies now holding $5,884,000 of these securities, will increase the company's cash.

★ ★ ★ ★ ★

To keep 'em flying, keep on buying
Defense Stamps and Bonds

★ ★ ★ ★ ★

Pearl Harbor Attack Revives Interest in Hawaii Cement Plant

Plans for a cement plant at Hawaii, which have been developed by Hawaiian Gas Products, Ltd., are bright at the present time and the actual construction and operation of a plant on Oahu await only the "green light" from authorities, Allan Renton, president and manager of the company, reports.

The proposal was put up to Washington officials as early as last October, at which time great interest was expressed in the island scheme.

Hawaiian Gas Products proposes as a starter to convert its lime plant into a cement plant, with an estimated output of 200 barrels or 800 bags of cement daily.

"This is not a lot of cement compared to Hawaii's daily needs," said Mr. Renton, "but it would take up the slack between shipments from the coast which have been slowed up since the Pearl Harbor attack.

"What we hope to do, however, is develop a plant capable of turning out 2,000 barrels a day. Such a plant would be a Defense Plant Corporation project. The government would erect and finance the plant and we would operate it."

Pointing to the economic advantages of such a plant, Mr. Renton said that one ship bringing 125,000 barrels of oil to operate the plant would save the space used by 34 vessels in bringing cement to Hawaii. The steel needed to build such a plant would be the equivalent of the steel needed to build about half an average sized freighter operating between Honolulu and the mainland.

Output of Fluorspar Up as Demand Soars

The domestic fluorspar industry was called upon to supply an unprecedented demand in 1941 to meet the requirements of steel mills and aluminum plants, both of which made new production records, and the greatly accelerated needs of manufacturers of glass, enamel, and hydrofluoric acid, according to final 1941 figures made public today by the Bureau of Mines, United States Department of the Interior.

Shipments from mines in 1941, amounting to 320,669 short tons, were 37 per cent. greater than in 1940 and 22 per cent. more than the previous record (263,817 tons) made in 1918 of World War I. The shipments in 1941 were sufficient not only to take care of consumption, but enabled consumers to increase inventories slightly.

CURRENT BUSINESS INDICATORS

Barring a miracle in the last half of March, war production during the first quarter of 1942 appears certain to fall substantially short of the President's objectives. Specific information on war output is now banned by censorship regulations, but it is generally understood that the most serious lag is in merchant-ship construction. The unfavorable showing in this phase of the program is attributed by W. H. Harrison, Chief of the WPB Production Division, to material shortages. Despite this difficulty, Chairman Donald Nelson insists that the goal of 8,000,000 tons of merchant ships not only can but must be met. As a result, another wholesale reorganization of the War Production Board appears to be pending.

Apart from shipbuilding, war production seems to be making steady progress. In the production of ordnance the record is said to be particularly encouraging. Although output is climbing, an underlying current of dissatisfaction with the production effort as a whole pervades Washington. For this reason, a drive has been launched to vitalize the program. The salient features of the plan are:

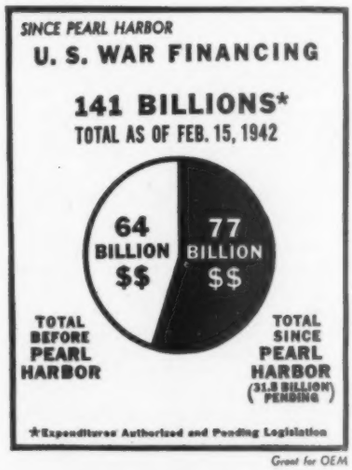
(1) Joint management-labor committees to push production and devise ways to do the job better.

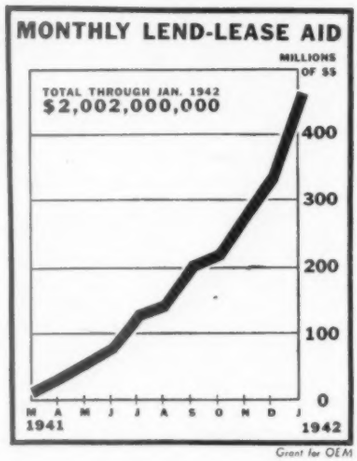
(2) Production schedules for each primary producer, with scoreboards by which each shift may mark its progress toward the goal.

(3) Awards of merit for individuals giving distinguished service on the production line.

(4) Reports on performance of weapons by the soldiers who use them directly to the men who build them.

By means of this program it is hoped that production can be increased by 25 per cent.





On the heels of the announcement of the new production drive Chairman Nelson issued a directive abolishing competitive bidding on all military supply contracts. From now on contracts will be made subject to negotiation, unless the use of competitive bids is specifically authorized by the Director of Purchases. This procedure is expected to result in speedier procurement and in the broader use of the country's productive facilities.[1]

Meanwhile, expenditures for war are rapidly approaching the staggering total of $100,000,000 per working day. In February the aggregate expenditures for war purposes amounted to $2,330,000,000. This represents a daily rate of $97,000,000, an increase of 17.6 per cent. over January.

Results of this spending record are reflected in business activity. According to the Federal Reserve Board, industrial production advanced to 173 per cent. of the 1935-39 average in February. This compares with a revised index of 171 in January and 144 in the corresponding month of last year.

Although the change-over to a war-production basis tended to retard output in many branches of industry, the gains during February were surprisingly widespread. Moreover, in such industries such as mining, lumbering, and food processing, which ordinarily experience a sharp curtailment at this season of the year, activity was remarkably well sustained. This suggests that the change-over to war production is being accomplished without curtailing aggregate industrial production. On this account the Federal Reserve Board now predicts an almost steady rise in the composite index of industrial activity throughout the current year. By December it is expected that the index will stand at approximately 190 per cent. of the 1935-39 average.

The output of steel in February, according to the American Iron and Steel Institute, was at the second highest rate on record. The weekly production of ingots and castings averaged 1,631,278 net tons during the month, a substantial gain over January and roughly equivalent to the October 1941 peak of 1,634,917 tons.

Another noteworthy development of the past month was the sharp rise that occurred in construction. According to the F. W. Dodge Corporation, the value of building and engineering contracts awarded during February in 37 Eastern States totaled $433,557,000. This compares with $316,846,000 in January and $270,373,000 in February 1941.

The general price level, meanwhile, continues to advance. At the end of February the Bureau of Labor Statistics over-all index of wholesale commodity prices stood at 96.8 per cent. of the 1926 average, up about 1 per cent. compared with a month ago. In the past year wholesale prices have advanced 20 per cent. and are now almost a third above the pre-war level.

Income, however, has managed to keep pace with the rise in prices. A report just released by the Department of Commerce indicates that national income last year reached an all-time high of $94,500,000,000, an increase of 22 per cent. over the 1940 total. Of this total, wages and salaries accounted for $61,200,000,000, a 25-per cent. increase over the previous year. This increase reflects the effects of fuller employment, longer hours of work, and higher wage rates.

[1] [See page 33 in this issue.—EDITOR.]

Industrial Trucks.—A two-month extension until May 10 of Preference Rating Order P-40, making available an A-1-g rating for materials going into the manufacture of industrial lift trucks and replacement parts was announced March 7 by the War Production Board.

The existing order expired March 10. It is designed to insure an adequate supply of lift trucks widely used in lifting, hauling and moving war materials.

Manufacturers of these trucks are expected soon to file material requirements under the Production Requirements Plan, and the extension of the A-1-g rating is designed to enable them to continue to get materials pending the transition to PRP.

WPB advised manufacturers that Order P-40 will in no event be extended beyond May 10.

Manila Cordage.—Manufacturers of Manila cordage are permitted, under Amendment No. 4 to General Preference Order M-36, issued March 7, to sell or deliver during the 5-month period of March 1 to August 1, 1942, five times their monthly quotas (basic monthly privilege) fixed in Amendment No. 3. The monthly quota amounts to 70 per cent. of the average monthly sales during 1939.

Mechanical Rubber Goods.—The War Production Board has added several groups of products to its lists of permitted uses of crude rubber and latex, but at the same time ordered general reductions in the amounts of both rubber and latex which are permitted to be consumed in specific articles. Amendment No. 5 to Supplementary Order M-15-b, announced March 3 by Director of Industry Operations James S. Knowlson, substitutes four new lists of permitted products and uses, effective March 1. The new List "A"—that listing products for which crude rubber may be used to certain percentages—now contains 31 groups, compared with an original list of 19. Most of the additions included on the new lists were allowed during February on special appeal from manufacturers, and all of the newly permitted articles are considered necessary to keep essential industries operating.

Examples of increases in permitted consumption rates are rubber-lined tanks, pipes, and fittings, which may now use rubber at a rate of 140 per cent., compared with 100 per cent. under the previous order; and electricians' gloves, 200 per cent. against 100 per cent. Among reductions are fire and mill hose—from 180 per cent. to 40 per cent.; suction and welding hose—from 140 per cent. to 100 per cent.; and conveyor belts—from 140 per cent. to 125 per cent.

An over-all summary of the general purposes for which rubber may be consumed, shown in the new List "A", and the percentages of the base rate, follows:

Concentrator belts, elevator belts, and repair material, 125 per cent.
Cleats and bucket pads, and non-automotive V-belts, 100 per cent.
Flat transmission belts, 80 per cent.
Acid, chemical, sand blast, and high pressure hose, 125 per cent.
Industrial vacuum, steam, suction, and welding hose, 100 per cent.
Brewers, gasoline, and sanitary hose, 8 per cent.
Fire and mill hose, 40 per cent.
Rubber-lined tanks, 140 per cent.
Rubber buckets, pails, and pumps, 100 per cent.
Storage-battery parts, respirators, and cable-splicing compounds, 125 per cent.
Chute lining, and oil-well specialties, 100 per cent.
Abrasive wheels, 160 per cent.
Switchboard mats, 25 per cent.
Automotive parts, 75 per cent.

P-56 and P-56-a Amended Again.—Higher ratings for repair and maintenance of essential mine machinery and lower ratings or complete elimination of ratings for non-essential mining purposes are provided by an amendment of Preference Rating Order P-56, announced March 3 by the Director of Industry Operations, WPB. The higher ratings will assure continuous production from the mines of essential materials.

At the same time Preference Rating Order P-56-a, which formerly assigned a single rating to material entering into the production of mining machinery and equipment, has been amended to permit the assignment of rating or ratings to a producer based on the pattern of ratings on the orders he is engaged in filling by a procedure similar to the Production Requirements Plan (PRP).

The A-3 rating formerly assigned to materials for repair and maintenance of mining machinery has been withdrawn, and an A-1-c rating has been assigned to materials for the repair and maintenance of essential machinery with specified restrictions, subject to a quarterly quota to be established for each mining enterprise by the Director of Industry Operations. Certain less essential mining operations, including sand, gravel, stone, clay, gypsum, talc, soapstone and slate, may use the A-1-c rating only in cases of imminent breakdown.

The A-8 rating assigned to materials for maintenance and repair not covered by the A-1-c rating is continued in effect, and an A-10 rating is assigned to repair, maintenance and operating supplies such as office supplies which are not closely connected with actual production.

The following letter, written by Administrator Wilbur A. Nelson on March 2, explains the changes briefly:

To Mine Operators and to Manufacturers of Mining Machinery, Equipment and Repair Parts:

Mine operators have been faced with a critical problem in securing the necessary repair parts and machinery needed to keep the nations' mines running at the high levels required by the Victory Program. Manufacturers of machinery and equipment have had similar difficulty in securing their raw materials.

To meet this situation the War Production Board has to-day issued amendments to Preference Rating Orders P-56 and P56-a. A copy of the amendment to the order under which you hold a serial number is inclosed herewith.[1] It should be studied carefully, as the privileges which it grants are limited in extent, and the limitations imposed must be strictly complied with. Briefly summarized, the amendments are to the following effect:

(1) Gold and silver mines are no longer entitled to use the ratings assigned by the Order.

(2) The A-1-a rating for repair of actual breakdowns is continued in effect. It can be applied only after advance approval by the Director of Industry Operations.

(3) An A-1-c rating is given to deliveries to essential mines of repair parts for essential machines. An Operator is restricted in applying this rating to a quota established quarterly by the Director of Industry Operations.

(4) An A-1-c rating is given to deliveries of other repair parts and to other mines when necessary to avert breakdown. This rating can be applied only after advance approval by the Director of Industry Operations.

(5) The A-3 rating formerly in effect is withdrawn.

(6) Deliveries of essential machinery and equipment receive such preference ratings as may be assigned by the Director of Industry Operations after advance application.

(7) The A-8 rating for other repairs and for material for maintenance and operating supplies for essential productive purposes is continued.

(8) An A-10 rating is given for repair, maintenance and operating supply material not closely connected with production, *e.g.*, office supplies.

(9) Suppliers can extend at the same level the ratings received from Operators.

(10) Reports of applications of preference ratings by Suppliers are no longer required. Reports from manufacturers of mining machinery will be obtained under P-56-a.

WILBUR A. NELSON
Administrator of Mining Branch

Subsequent to the writing of the letter reproduced above, the following communication was sent out:

WAR PRODUCTION BOARD
Washington, D. C.
Mining Branch
Wing One, First Floor
Temporary Building E
Sixth and Adams Drive, S.W.

[1] [See below, page 32.—EDITOR.]

Operators of Mines to which serial numbers have been assigned under General Preference Rating Order P-56:

Referring further to the amendment of General Preference Rating Order P-56 effective March 2, 1942:

The A-1-c rating may be assigned by endorsement in the form as set forth in Paragraph (E) (4) of General Preference Rating Order P-56, as amended on December 2, 1941,[2] to purchase orders for repair parts for machinery and equipment as listed in Schedule "A." The new Schedule "A" is reproduced above. However, this rating may be applied by the mine operator only to deliveries in any calendar quarter of a quota consisting of such dollar value of repair parts as may be expressly authorized by the Director of Industry Operations after application is made by such operator in the form prescribed by the Director of Industry Operations. You will shortly be notified of the form and procedure in this respect.

However, for the first calendar quarter of 1942, the quota will be arrived at by each operator on an honor system on the following basis (a hypothetical example will be given, step by step):

(A) Using the total dollar value of repair parts for equipment on Schedule A which were received during the last calendar quarter of 1941, and the total tonnage output of production during that same quarter and its dollar value f.o.b. the mine, a base figure of value of repair parts per dollar of value of the output will be calculated.

(Example: Assuming that the total dollar value of repair parts received during the fourth quarter of 1941 at a given mine was $3,000, and the total output was 600,000 tons valued at $1.00 per ton, the base figure for the fourth quarter would be $0.005 per dollar value of the mined material produced.)

(B) Then an average figure for the dollar value of mine production to be produced during March 1942 will be arrived at by adding the figures for January and February 1942, increasing this total by 50 per cent. and dividing by 3.

(Example: Assuming that January production was 220,000 tons, valued at $1.00 per ton and the February production 190,000 tons, valued at $1.00 per ton: Total $410,000 of production. Adding 50 per cent., the total is $615,000 of production. Dividing by three, the figure to be used for the dollar value of the March production would be $205,000.)

(C) Using the basic figure from (A), and the March production value figure from (B), the quota for March for this category of repair parts is calculated.

(Example: The basic figure from the example is $0.005, and the March production figure is $205,000; then, the quota for March would be $1,025.00. The operator of the mine illustrated in this example can then assign the A-1-c rating to deliveries of repair parts of this category for a total amount within but not exceeding $1,025.00.)

In arriving at the quota the operator of a mining property from which part of the output is produced by contractors (as for example, stripping or open-pit contracts) the repair parts used by the contractor, and the production from the phase of the operation should, of course, be included in the figures used. This is essential, inasmuch as the Legal Department of the War Production Board has ruled that ratings under P-56 can be applied to the contractor's purchase orders only by the operator to whom the serial number has been issued, for the mine at which the contractor is doing work.

Of course, the A-1-c rating should be used only if the A-10 and A-8 ratings will not obtain delivery in proper time. Also it must be emphasized that the A-1-c ratings can be applied, during a given period, only to the extent of the quota for that period.

WILBUR A. NELSON
Administrator of Mining Branch

[2] [See PIT AND QUARRY, January 1942, pages 63, 114-116.—EDITOR.]

The complete text of the amended order follows:

TITLE 32—NATIONAL DEFENSE
CHAPTER IX—WAR PRODUCTION BOARD
Subchapter B—DIVISION OF INDUSTRY OPERATIONS
Part 982—MINES
PREFERENCE RATING ORDER P-56
(As amended to March 2, 1942)

Section 982.1 is hereby amended to read as follows:

982.1. Preference Rating Order. For the purpose of facilitating the acquisition of material for continued and expanded operation of mining enterprises in the public interest and to promote the national defense preference ratings are hereby assigned to deliveries of such material upon the terms hereinafter set forth:

(a) *Definitions*

(1) "Person" means any individual, partnership, association, business, trust, corporation, governmental corporation or agency, or any organized group of persons whether incorporated or not.

(2) "Mining enterprise" means

(i) any plant actually engaged in the extraction by surface, openpit, or underground methods, or in the beneficiation, concentration, or preparation for shipment of the products of mining activity, but not including any plant more than 30 per cent. of the production of which in dollar value consists of gold and/or silver.

(ii) any plant wholly engaged in the processing and burning of refractories;

(iii) any prospecting enterprise for the discovery or exploration of new or additional mining projects.

(3) "Operator" means any person operating a mining enterprise, who holds a serial number issued in accordance with the provisions of paragraph (b).

(4) "Supplier" means any person with whom a purchase order or contract has been placed for delivery of material to an operator or to another supplier.

(5) "Material" means any commodities, equipment, accessories, parts, assemblies, or products of any kind.

(6) "Maintenance" means minimum upkeep necessary to continue the working condition of equipment used by an operator in the operation of a mining enterprise at its then current rate of production or operation.

(7) "Repair" means the restoration of property or equipment used by an operator in the operation of a mining enterprise to a sound working condition after wear and tear, damage, destruction, or failure of parts or the like have made the property or equipment unfit or unsafe for service.

(8) "Operating Supplies" means material which is essential to and consumed in the operation of property and equipment used by an operator in the operation of a mining enterprise and which is generally carried as operator's stores and charged to operating expense account. The term does not include raw materials which enter into or form part of the finished product.

(b) *Certification of Mining Enterprises*

(1) *Domestic Mining Enterprises.* The agency designated by the governor or other chief executive officer of each state, territory, or possession of the United States, including the Commonwealth of the Philippines, shall furnish to the War Production Board a certificate setting forth the names of the persons operating mining enterprises within such state, territory, or possession. The War Production Board will thereupon issue a serial number or numbers to each such person who may be approved by the Director of Industry Operations. Any person aggrieved by failure or refusal of a state agency to certify him as an operator may apply in writing to the Director of Industry Operations for issuance of a serial number. The Director of Industry Operations may thereupon take such action as he deems appropriate. Serial numbers may be cancelled by the Director of Industry Operations in appropriate cases.

(2) *Foreign Mining Enterprises.* The Director of Industry Operations may, in his discretion, issue a serial number or numbers to a person operating a mining enterprise outside the limits of the United States, its territories, and possessions and may cancel any such serial number.

(3) *Standards.* In issuing, denying, or cancelling serial numbers, the Director of Industry Operations will consider the importance to national defense of the present and prospective output of materials to be produced, the consumption of essential materials by the mining enterprise in its operations, the necessity to the mining enterprise of obtaining priorities assistance, and the available alternative methods of obtaining such assistance.

(c) *Assignment of Preference Ratings*

Subject to the terms of this order, the following preference ratings are hereby assigned: provided, that no preference rating is assigned to the delivery of any machinery or equipment, or repair parts therefore, unless such machinery and equipment are used primarily to maintain or to increase the existing production of the mining enterprise, and not primarily to reduce operating costs. Nothing herein contained shall prevent the use of any other or higher rating to which any person may be entitled by reason of any other preference rating certificate or order.

(1) *As to Deliveries to an Operator.*

(i) A-1-a to deliveries of material for repair of property and equipment used in and essential to the operation of a mining enterprise, when and only when there has been an actual breakdown or suspension of operations because of damage, wear and tear, destruction or failure of parts, or the like, and the essential material is not otherwise available.

(ii) A-1-c to deliveries of repair parts for machinery and equipment of the types listed in Schedule A hereto; provided, that such repair parts are for use in mining enterprise less than 30 per cent. of the production of which in dollar value for the previous calendar quarter was derived from any one or more of the following:

Sand (except foundry sand), gravel, crushed stone, and slag, including all commercially recognized forms of these products;

Clay of all types, except those used for refractories and ceramics for electrical use;

Building and ornamental stone of all types;

Gypsum, talc, soapstone, slate (except for electrical use), and all raw material for the manufacture of lime and calcareous cements.

Such rating shall be applied by any operator only to deliveries in any calendar quarter of a quota consisting of such dollar value of repair parts as may be expressly authorized by the Director of Industry Operations after application by such operator in form prescribed by the Director of Industry Operations. For the first calendar quarter of 1942 such quota shall be the dollar value of repair parts which bears the same ratio to the dollar value of repair parts delivered to the operator in the last calendar quarter of 1941 as the dollar value of the operator's production in the first calendar quarter of 1942 bears to the dollar value of the operator's production in the last calendar quarter of 1941.

(iii) A-1-c to deliveries of repair parts for essential productive facilities to other mining enterprises and/or for other types of machinery and equipment up to the minimum required to make reasonable advance provision to avert an actual breakdown or suspension as described in paragraph (c) (1) (i).

(iv) A-8 to deliveries of material for other repairs to, for maintenance of, and for operating supplies for, property and equipment used in and essential to the operation of a mining enterprise.

(v) to deliveries of essential machinery and equipment, whether or not included in Schedule A, such preference ratings as the Director of Industry Operations may from time to time assign to particular orders for such equipment submitted to him for approval in the manner described in paragraph (e) (2) below.

(vi) A-10 to deliveries of material for all other repairs, maintenance and operating supplies.

(2) *As to Deliveries to a Supplier*

Deliveries of material which will be delivered (or physically incorporated into material which well be delivered) to an operator under any preference rating assigned by or pursuant to paragraph (c) (1) are assigned the same preference rating as that assigned to the delivery to the operator.

(d) *Persons Entitled to Apply Preference Ratings*

The preference ratings hereby assigned may be applied by

(1) An operator, or

(2) A supplier to enable it to make to an operator or to another supplier deliveries on purchase orders or contracts endorsed or otherwise identified pursuant to paragraph (e).

(e) *Application of Preference Ratings*

(1) *Application of A-1-a or A-1-c Rating by Operator.* An operator, in order to apply the A-1-a preference rating assigned by paragraph (c) (1) (i) or the A-1-c preference rating assigned by paragraph (c) (1) (iii), must communicate with the War Production Board, Washington, D. C., Ref.: P-56, describing the material needed for emergency repair and the nature of the emergency, or the reasons why advance provision is necessary to avert breakdown or suspension, and such other information as may be required.[2] The Director of Industry Operations will notify such operator, whether, and to what extent, its application is approved, and a copy of such notification shall be furnished by the operator to its supplier to evidence the A-1-a or A-1-c rating.

[2] [The form to be used in applying for equipment for repair is given below.—EDITOR.]

Mining Branch
COAL — First Floor, Wing One
METAL — Temporary Building E
NONMETALLIC — Sixth & Adams Drive, S. W.
Washington, D. C.

A-1-a INFORMATION

Also A-1-c (for mines on restricted list, and for repairs to equipment not on Schedule A)

Date.....

1. Company .....
2. Address .....
3. Serial number and mine name.....
4. Type of product.....
5. Annual production .....
6. Number of men employed.....
7. Describe nature of emergency:
   (a) Impending breakdown .....
   (b) Breakdown, when did it occur?.....
8. Tonnage loss per day
   (a) due to emergency.....
   (b) due to breakdown.....
9. Number of men out of work.....
10. Major defense contracts now being supplied with your material.....
11. Percentage of your total plant production going to defense work.....
12. Material needed and cost:.....
    (a) Weight, if metallic plates and/or castings .....
13. Name and address of actual supplier.....
14. Your purchase order number.....
    Date placed.....what dealer.....
15. Delivery date promised on A-1-a.....
    A-1-c.....

Action taken

Signed.....

(2) *Application of Ratings by an Operator to Deliveries of Machinery or Equipment.* An operator, in order to apply the ratings assignable under paragraph (c) (1) (v), must communicate with the War Production Board, Washington, D. C., Ref.: P-56, describing the machinery or equipment needed and the reasons why such machinery or equipment is essential for the proper operation of the mining enterprise.[3] The Director of Industry Operations will notify such operator whether its application is approved and, if approved, shall assign a preference rating thereto; a copy of such notification and assignment of rating shall be furnished by the operator to his supplier.

(3) *Standards.* In acting on any application pursuant to paragraph (e) (1) or (2), the Director shall consider the isportance to antional defense of the material to be produced by the machinery, equipment, or other material for which rating is requested, and the consumption of scarce materials in the construction thereof.

(4) *Application of Other Ratings by Operator or Supplier.* An operator, in order to apply the A-1-c preference rating assigned by paragraph (c) (1) (ii), the A-8 preference rating assigned by paragraph (c) (1) (iv), or the A-10 rating assigned by paragraph (c) (1) (vi), or a supplier, in order to apply any preference rating assigned by paragraph (c) (2), must endorse the following statement on the original and all copies of the purchase order or contract for such material, signed by a responsible official duly designated for such purpose by such operator or supplier:

"Materials for a Mining Enterprise, Rating A- ——— under Preference Rating Order P-56, Serial No. ———— and in compliance therewith.

.....
(Name of Operator or Supplier)

By .....
(Authorized Signature)"

If the material is for export outside the limits of the United States, its territories and possessions, the Commonwealth of the Philippines, or the Dominion of Canada, such endorsement shall also contain the sentence:

"This material is for export and is covered by Export License No. ———— dated ————."

Such purchase order or contract so endorsed shall be delivered to the supplier of such material. Such endorsement shall constitute a representation to the War Production Board and the supplier with whom the purchase order or contract is placed that such purchase order or contract is duly and properly rated in accordance herewith. Such supplier shall be entitled to rely on such representation, unless he knows or has reason to believe it to be false. Any such purchase order or contract shall be restricted to material the delivery of which is rated in accordance herewith. With respect to any purchase order or contract for such material placed before the effective date of this order, such preference rating may be applied by delivering to the seller a duplicate copy of such purchase order or contract so endorsed.

(5) An operator or supplier placing any such rated purchase order or contract, and the supplier of the material covered thereby, must each retain endorsed copies of all such purchase orders or contracts, and certificates and notifications made or received pursuant to this paragraph (e), for a period of two years from the date thereof, for inspection by authorized representatives of the War Production Board.

(6) *Restrictions on Deliveries by Supplier.* No supplier shall deliver machinery, equipment, or repair parts to an operator or another supplier under any rating—

(i) unless such supplier has received from such operator or such other supplier all certificates and notifications required by paragraph (e).

(ii) if such supplier knows or has reason to believe that such material is not properly rated under the terms of this order.

A supplier must report forthwith to the War Production Board the details of any such attempt to apply any rating in violation of the terms of this order.

(f) *Restrictions on Application of Rating*

(1) The preference ratings hereby assigned shall not be applied

(i) unless the material to be delivered cannot be secured when required without such rating;

(ii) to obtain deliveries greater in quantity or on dates earlier than required for the operation, maintenance, or repair of the property or equipment used by an operator in (and essential to) the operation of a mining enterprise;

(iii) by a supplier to obtain material in excess of the amount necessary to make rated deliveries.

(g) *Restrictions on Inventory*

No operator shall accept deliveries (whether or not rated pursuant to this order) of operating supplies or other material which will increase such operator's inventory of such operating supplies or other material to an amount greater than the minimum necessary for the efficient operation of his business, and the ratio of inventory to current production shall in no event exceed the ratio of average inventory to average production for the years 1938, 1939, and 1940.

(h) *Resale of Operating Supplies and Other Material Prohibited*

Except with specific permission of the Director of Industry Operations, no operator shall resell any operating supplies or other materials (whether or not obtained pursuant to rating assigned by this order) except to another operator.

(i) *Conservation and Standardization*

Every person affected by this order shall use his best efforts to effectuate conservation of materials by elimination, simplification, or standardization of types, sizes, or forms, or otherwise, and to cooperate in any program developed for such purpose by the War Production Board. The Director of Industry Operations may from time to time issue specific directions as to conservation, elimination, and standardization.

(j) *Relief*

In case the productivity or sound working condition of any mining enterprise is adversely affected by any provision or application of this order or by inability to obtain essential operating supplies or other materials, the person operating such mining enterprise may apply for relief to the Director of Industry Operations. The Director of Industry Operations

[3] [The following form is to be used in applying for ratings for the purchase of new equipment.—EDITOR.]

NEW EQUIPMENT INFORMATION

Mining Branch
COAL — First Floor, Wing One
METAL — Temporary Building E
NONMETALLIC — Sixth & Adams Drive, S. W.
Washington, D. C.

Date.....

1. Company .....
2. Address .....
3. Serial number .....
4. Type of product.....
5. Present output .....
6. Expected increase in output.....
7. Number of men employed.....
8. Number of days worked in preceding month .....
9. Description of machinery or equipment requested and reason for request.....
10. Your purchase order No....Date placed...
    Supplier .....
11. Cost.....
12. Weight if metallic plates or castings.....
13. Delivery date promised.....
14. List major defense customers to whom you are shipping .....
15. Approximate percentage of your production which goes to defense work.....

Action taken

Signed.....

may thereupon take such action as he deems appropriate.

(k) *Records, Audit, and Reports*

Each operator and each supplier shall keep and preserve for a period of not less than two years accurate and complete records of all transactions affected by this order and shall submit from time to time to audit and inspection by duly authorized representatives of the War Production Board. Each operator and each supplier shall execute and file with the War Production Board or other designated agency, such reports and questionnaires as the War Production Board shall from time to time require. Until otherwise directed, each operator shall file with the designated State Agency on or before the 10th day of each month a report on form PD-119 of purchases made during the preceding month pursuant to the ratings granted by this order.

(l) *Violations*

Any person affected by this order who violates any of its provisions, or a provision of any other order, regulation, or other directive of the War Production Board may be deprived of priorities assistance, or subjected to such other or further action as the Director of Industry Operations may deem appropriate.

(m) *Revocation or Modification*

This order may be revoked or modified by the Director of Industry Operations at any time as to any operator or supplier. In the event of revocation, or upon expiration of this order, deliveries already rated pursuant to this order shall be completed in accordance with said rating, unless the rating has been specifically revoked with respect thereto. No additional applications of this rating to any other deliveries shall thereafter be made by the operator or supplier affected by said revocation or expiration.

(n) *Amendment of Prior Order*

The provisions of Preference Rating Orders P-22 or P-100 shall not apply to deliveries to which a preference rating is assigned by this order.

(o) *Effective Date*

This order shall take effect immediately and shall continue in effect until revoked.

Issued this 2nd day of March, 1942.

J. S. KNOWLSON
Director of Industry Operations

SCHEDULE "A"

As to all machines listed below, the rating provided herein likewise applies to equipment items, accessories, and tools customarily sold with such machines.

Aërial-tramway equipment
Air-compressors for mine use
Air-distribution equipment
Assaying and testing laboratory equipment at the mine

Ball-casting machines
Box-car loaders

Cages and skips
Car dumpers — rotary or end
Equipment for cleaning plants
Equipment for concentrating plants
Conveyors — shaking, belt, chain, or gravity type, including duckbills and other self-loading heads
Cutting machines—cable reel and self-propelling transportation trucks therefor

Diamond core-drilling machines
Drag-line dredges, excavators, and scraper units
Dredges — continuous bucket, including pumps

Drills and drilling machines, power-driven, and reconditioning equipment therefor
Dust-control equipment

Electrical equipment for mine transportation and power

Hoists — including room hoists and car pullers
Hydraulic monitors, with feed pipe and fittings

Jacks for lifting and roof support

Lamps—mine, miners', safety and ore-exploration types
Locomotives for mine use
Loaders, mobile, including mucking machines
Equipment for milling plants

Mine cars, track or trackless

Pit-car loaders and elevating conveyors
Equipment for preparation plants
Pumps, pipe and fittings for mine drainage or material transport

Rock-dusting equipment

Safety and defense equipment
Sand driers
Scraper loaders
Sheaves and sheave blocks
Shovels—power
Shuttle cars—track or trackless
Slusher hoists and scrapers
Steel sections for support of mine openings
Storage batteries for mine use

Tanks and bins for storage of mine products
Tipples and head frames
Track and track accessories for mine transportation
Equipment for treating plants
Trucks, tractors, and trailers for mine use

Ventilation equipment

Waste-disposal equipment
Weighing equipment, including automatic devices
Wire rope for haulage and hoisting

Procurement Policy.—On the heels of his announcement of a vast production drive to get an immediate increase in America's output of war goods, Chairman Donald M. Nelson of the War Production Board on March 4 signed a directive which broadens procurement policies to insure the widest possible placement of war-supply contracts and a much greater utilization of small plants and factories.

The directive has these provisions:

1. Effective at once, all military supply contracts are to be placed by negotiation instead of by competitive bidding, unless the Director of Purchases, WPB, specifically authorizes the use of competitive bids.

This provision is expected to result in speedier procurement and in broader use of the nation's productive capacity. Under competitive bidding large concerns, which already hold extensive war contracts, are often able to under-bid small manufacturers who are not doing any war work at all; when this happens, the contract ordinarily is given to the low bidder, even though that may prevent a perfectly capable small firm from getting into war production.

2. In placing contracts primary emphasis is to be put upon speed of delivery.

This provision is frankly designed to shift the emphasis away from price and put it upon speed. More favorable prices are often obtained by a sacrifice of speed; by shifting the emphasis quicker deliveries can be had at comparatively minor increase in cost.

3. Contracts for standard and semi-standard articles relatively simple to make shall be placed with smaller concerns, so that the facilities of the larger, more fully equipped firms may remain available for production of more difficult and complicated items.

The services buy some articles which can be made by large numbers of companies, large and small; they buy others which only the biggest manufacturers can handle. If contracts for articles in the first classification are placed with the biggest concerns, the facilities of the smaller firms go unused while the facilities of the big firms are tied up with work that could be produced elsewhere. By ruling that the big firms be saved for the big difficult jobs, the production program gains all around.

4. Subject to these considerations, contracts are to be placed with concerns which need the smallest quantities of new machinery and equipment.

This is designed to get most efficient use of the nation's machine-tool capacity and to bring into service as many idle tools as possible.

Road-Building Equipment.—The WPB announced on March 11 amendments to Preference Rating Order P-19-e, administered by the Public Roads Administration and used to extend priority assistance to highway contractors. The changes in the terms of the order eliminate extension of the preference ratings granted a road project to the purchase of road-building machinery and equipment, though permitting its use to expedite delivery of repair parts when necessary to prevent stoppage of work which might result from accidents to equipment. When new equipment is necessary for an essential project, application for a preference rating may be made on Form PD-1A.

Truck and Trailer Parts.—The War Production Board on March 6 announced a 1942 program for the production of spare parts for medium and heavy trucks, truck trailers and buses, designed to keep these vehicles in running order.

Orders were issued raising from A-3 to A-2 the Preference Rating available for deliveries of materials for replacement parts. The program does not affect production of parts for the Army and Navy and other designated government and Lend-lease operations.

WPB raised the rating because it is necessary to the war program to keep existing trucks and buses running. The A-2 rating will give manufacturers a better opportunity to obtain quick delivery of necessary materials.

Under amendments to Limitation Order L-35 and Preference Rating Order P-107 issued and effective March 5, which supersedes the original orders announced January 22, WPB authorized producers and suppliers to apply the A-2 rating to obtain deliveries of materials going into the manufacture of designated spare parts. The orders apply only to medium and heavy trucks, truck trailers, passenger carriers and school bus bodies. Parts for which the new rating may be used are listed in both the Limitation Order and the Preference Rating Order.

Since WPB has instructed manufacturers to stop production after March 1 of civilian trucks having a gross vehicle weight of less than 16,000 pounds, it has become necessary to set up a long-range program for spare-part production. Under this program, producers can make during the entire year up to 150 per cent. of the number of spare parts sold by them for replacement purposes during 1941. In order to give manufacturers more operating freedom, the order provides that from January 1 to June 30, producers may not manufacture more than 75 per cent. of the number of spare parts sold by them for that purpose during 1941, and that from January 1 to September 30, the manufacturing limit shall be fixed at 112½ per cent. of the number sold during 1941. For the entire year, the rate amounts to 150 per cent.

Many of the replacement parts covered by the orders are interchangeable in passenger cars or light trucks, production of which was halted February 1. In order to permit manufacturers to interchange parts, the orders provide that the A-2 rating may be used to obtain materials for the production of up to 40 per cent. of the number of parts that can be interchanged.

Truck and Trailer Rationing.—A rationing program for all types of new trucks, truck-tractors and trailers was announced March 1 by J. S. Knowlson, Director of Industry Operations.

The plan, effective March 9, will be administered jointly by the War Production Board and the office of Defense Transportation. It is set forth in General Conservation Order M-100.

Since the start of the year, sales and deliveries of new trucks and trailers have been prohibited by the so-called "freeze" orders, which were extended until March 8. Rationing will permit gradual release of "frozen" stocks and make these vehicles available to government and essential civilian users.

Application forms and necessary instructions to applicants will be made available at all truck and trailer sales agencies. These forms will furnish data upon which WPB, in consultation with ODT, will determine if an applicant is entitled to purchase a restricted vehicle.

The Office of Price Administration has been given authority to ration passenger automobiles, but will not handle the rationing of commercial vehicles.

Preliminary estimates indicate that approximately 196,000 trucks and truck trailers will be available for rationing during the next 22 months.

Vehicles required by the Army and Navy, the Marine Corps, Maritime Commission, Lend-Lease, and certain other designated war operations will be released under a general "Governmental Exemption Permit," which will enable war agencies to make purchases without adhering to the routine outlined for non-war users.

Persons outside the exempted categories must send their purchase applications to one of the "Local Allocation" offices of ODT, which also serve as field offices of the Bureau of Motor Carriers of the Interstate Commerce Commission. Upon approval by a "Local Allocation" officer, the application will be sent to ODT headquarters in Washington. If approved there, it will be forwarded to WPB for review and action. WPB approval, in the form of a "Certificate of Transfer" issued by the Director of Industry Operations, will enable the applicant to purchase the type of truck or trailer he desires from any dealer in the country who has such a vehicle in stock.

The ODT is authorized to establish Appeal Boards to review rejected applications.

Under the program, five "Usage Classifications" are established. These, subject to revision, show the order in which trucks and trailers will be released for sale, according to their place in the war program. The classes are:

1. Vehicles used by the military forces in the field; police, fire-fighting and other public health services; mail, telegraph, telephone and organized radio communication services, and water-supply, sewage- and garbage-disposal and other sanitation services.
2. Vehicles used on fixed military and naval posts; transportation of all materials and equipment directly connected with the war effort, including farm and forest products; construction, maintenance and supply of essential rail, highway, water, pipe-line, and air transportation facilities; transportation of materials for construction of defense-housing projects; transportation of materials for construction and maintenance of public utilities in addition to those classed under No. 1, and transportation of persons engaged in business and industry directly connected with the war effort.
3. Vehicles used to transport ice and fuel for heating and power to the ultimate consumer; farm and forest products indirectly connected with the war program; essential roofing, plumbing, heating, electrical, building and vehicle repair services; waste and scrap materials; persons in business and industry indirectly connected with the war program, and in the services of public and private schools.
4. Vehicles used to transport persons or goods not connected with the war program, including all forms of retail delivery except of ice and fuel.
5. Vehicles used for non-essential functions.

With a limited supply of trucks and trailers, WPB offers no encouragement to persons who can qualify only under classes 4 and 5. These two classes were established so that there would be a "preference" guide in the event that the available supply was not exhausted under classes 1, 2 and 3.

An important feature of the program is that a preference rating, whether granted before January 1, before March 1 or after the rationing plan becomes effective, will not enable the holder to obtain a truck or trailer. The only way to secure a commercial vehicle will be to obtain a certificate under the rationing plan.

WPB established production quotas for medium and heavy trucks for February at a rate 15 per cent. above February, 1941. Quotas also were fixed for March, but these may be cancelled because of the shortage of rubber for tires and the effort to hasten conversion of the vast automotive industry to war work.

Trucks, Medium.—The War Production Board on March 4 prohibited further construction of medium trucks, after completion of February quotas, in order to save large quantities of critical materials, particularly rubber and steel.

Production quotas established for medium trucks for March were cancelled, and the only kind of trucks for which continued production will be permitted are those having a gross vehicle weight of 16,000 pounds or more. These trucks are commonly known as trucks having a capacity of 3 tons or more.

Manufacturers were ordered by WPB to make no further trucks of any sizes unless they can be produced from semi-fabricated or fabricated materials which were on hand February 28. Further fabrication of material is prohibited.

The order, Amendment No. 4 to Limitation Order L-1-A, retains the prohibition against equipping trucks to be produced under it with tires. Under previous orders tires may be placed on these vehicles only to enable their delivery to dealers, after which the tires must be returned to the manufacturer.

The new order, which will concentrate truck production on the heavier types necessary for hauling war supplies, will not affect the recent WPB authorization for manufacturers to carry over into March certain unfinished portions of production quotas established for February. These quotas, announced last January, allow manufacturers to produce medium and heavy trucks at a rate 15 per cent. higher than in February, 1941. The now discarded March quotas would have authorized medium and heavy truck output 34 per cent. above the March, 1941 production.

Truck Trailers.—The War Production Board on March 7 extended from February 28 until April 30 the A-3 Preference Rating available for deliveries of materials going into the manufacture of truck trailers. The extension applies also to materials used in the manufacture of medium and heavy motor-truck bodies and cabs, but does not apply to materials for the manufacture of complete trucks or truck chassis. No limitations are in effect at this time on the manufacture of truck trailers, but materials can be obtained by producers or suppliers only under Preference Rating Order P-54 which makes available the A-3 rating. After April 30 these manufacturers will be unable to get materials ratings unless they make application through the Production Requirements Plan.

Scarcity of Supplies Slows Up Research

A Bureau of Mines investigation and laboratory research that has continued for several years in the utilization of domestic materials for ceramics, including clays, feldspars, and others, is highlighted now by the difficulty of obtaining supplies formerly received from abroad, because of the war's interference with transportation.

Since a ceramics laboratory was established by the Tennessee Valley Authority at Norris, Tennessee, in 1936, the Bureau of Mines has coöperated with the T. V. A. and a clay company in North Carolina in tests of domestic materials and suitable methods for utilizing them efficiently in making ceramics.

EDITORIAL

The 40-Hour Week and War Production

DURING the last two weeks the American public has been assaulted, through the daily press and the radio, with an anti-labor campaign that, in extent, falsification, misrepresentation, and abuse of the rights of free speech and free press, has surpassed anything with similar objectives released in recent years. Given its initial impetus by H. V. Kaltenborn, CBS radio commentator, in his discussion on the *Town Meeting of the Air* on March 12, the movement gained momentum rapidly and flooded the offices of members of Congress with thousands of "canned" telegrams calling upon them for repeal of the 40-hour-week provision of the Fair Labor Standards Act.

Mr. Kaltenborn took his lead from a statement made March 8 by Irving Abramson, president of the CIO in New Jersey, in which the latter said that war plants in that state were using "only 49 per cent. of their productive capacity," and attributed this fact "mainly" to the "failure, refusal, or inability of industry to use the second and third shift." The reluctance of some employers to pay the legal overtime rates for extra work was also mentioned by Abramson. Kaltenborn, who can scarcely be called an impartial reporter, since he is sustained by groups that are interested in limiting the opportunities of labor and checking its progress, seized that portion of Abramson's remarks which touched on the employers' reluctance to pay overtime rates but utterly ignored the part which dealt with the employers' refusal to utilize the second and third shift. He thus laid the ground work for the false claim that the 40-hour week is limiting the production of war goods.

The very next day, by what may have been a coincidence, *The Daily Oklahoman* referred to Kaltenborn's speech and said that the survival of the United States depended on what happened in the ensuing 90 days. It urged its readers to demand immediate action of its Congressmen, and began to run daily a front-page "box" carrying the following pledge:

"I solemnly pledge that I will refuse to vote for the reëlection of any U. S. Senator or Congressman who does not consistently vote for a law outlawing strikes in every industry connected with defense and who does not vote to abolish the limitations of 40-hour-week labor in defense industries for the remainder of the war."

On March 16 Representatives Smith of Virginia and Vinson of Georgia introduced into Congress a bill to outlaw the closed shop, to prevent employers from entering into labor contracts providing overtime, double time, and 40-hour-week work schedules, and, as a gesture in the direction of impartiality, to limit the profits of companies working on government contracts to 6 per cent. of the cost of the contract. Of the profit-limiting provision of Smith's bill, his fellow Virginian, Senator Byrd, said that it is meaningless. To supply the dramatic element, designed to support the contention that opposition to the 40-hour-week was a great and spontaneous movement on the part of an outraged public, Representative Disney displayed an armful of mail "on the subject," Representative Wickersham claimed to have received 13,000 letters and telegrams in five days, and Representatives Johnson, Monroney and Cartwright said they would push the action to a successful conclusion. The mail which was offered as evidence of an "arouse public opinion" consisted largely of printed cards accompanied by the anti-labor pledge already quoted, while the presence of envelope bearing company names indicated rather clearly that employers had circularized their workers to agitate against the wage-and-hour law.

Heads of war and navy departments said, when interrogated, that the 40-hour week was not obstructing or delaying war production. In the Senate Senator Thomas quoted Admiral Land, chairman of the Maritime Commission, as having testified that strikes are not serious, Undersecretary of War Patterson as having said that conditions have greatly improved and that no legislation is needed, Assistant Secretary of the Navy Bard as having declared that strikes are affecting his department very little and that no anti-strike legislation is necessary, and Lieutenant-General William S. Knudsen, War Department Production Chief, as having said that there is no shortage of labor except among highly-skilled workers making precision tools. Speaker Rayburn asserted that on the day before he spoke between 7,000,000 and 7,500,000 men were engaged in war industries and only 100 were on strike.

MEANWHILE the newspapers were whipping up anti-labor feeling. The Scripps-Howard chain carried an editorial blaming labor for all the country's military woes. Oklahoma papers were reprinting *The Daily Oklahoman's* "boxed" pledge and echoing the sentiment of its editorial. Although Tom Girdler of the Consolidated Aircraft Corporation had said that "Labor is, with few exceptions, throwing itself unselfishly and wholeheartedly into the job of giving the country an air force," *The New York Times* did not mention the fact, although *The Herald Tribune* did. In spite of the fact that Glenn Martin, president of the Glenn L. Martin Company, said on March 11 that "The 40-hour week will not hamper the aircraft industry's production" and that "There has not been a serious labor stoppage since December 7," as quoted in the New York *Daily News, The Herald Tribune* omitted it. President Roosevelt said that five newspapers had written him asking why men were not allowed to work more than 40 hours a week, despite the fact that the Fair Labor Standards Act places no restrictions on the length of time in which a man may work but provides merely that the counting of overtime shall begin after 40 hours straight-time work has been performed.

Management and labor in defense industries know the truth of the situation; they know that the assertion that the 40-hour week is responsible for holding back the production of essential war goods is based on a false assumption and that insistence on the soundness of the claim is due to a desire to put labor back "in its place" and to check its advance, in peace time as well as war time, toward a better social and economic position. But that portion of the public which is neither management nor labor is being

grossly misinformed, because it depends almost exclusively for its knowledge of conditions upon the reports published by a press that is for the most part unfriendly to labor and by a system of radio reporting that is befuddled by the inspired remarks of commentators who are supported by interests that are similarly antagonistic. It is always unfortunate, and in this situation dangerous, that the general public does not have access to facts that will enable it to form its opinions intelligently, but is dependent on the "doctored" reports provided by the sources of misinformation as well as information on which it leans so heavily.

ON March 20 Donald M. Nelson, chairman of the War Production Board, on whose shoulders has been placed the responsibility for producing war goods rapidly and in ever-increasing quantities, appeared before the Military Subcommittee of the Senate Appropriations Committee to testify as to the truth or falsity of the claims that have been made about the effects of the 40-hour week on war production. He stated it as his belief that "to abolish the 40-hour-week law would be harmful to our production picture." "I do not see any particular legislation at the present time which I would regard as helpful," he added. "What we are working toward," he said, "is a 24-hour-a-day operation, seven days a week. That does not mean that each individual worker is expected to work seven consecutive days; it means that machines are kept in operation continuously, with six-day work shifts so dovetailed together as to make such continuous operation possible. I believe that there should be an extra-pay scale by which a worker called upon to work a seventh consecutive day would get paid over the base rate. Whether this should involve time and one-half or double time is doubtless a matter for further discussion. But it is the seventh day that is important. Where the worker does regularly get the seventh day off, and gets time and one-half or double time in case he does work on the seventh day, I do not believe that extra pay should apply to work on Sundays or holidays as such. The goal, in other words, is that the worker has one day in seven off and receives a premium for working on the seventh day. There should not be a flat provision by which Sunday and holiday work is given the premium."

Appearing before the same subcommittee, Secretary of Labor Perkins said with reference to the 40-hour week that "the only people who are working in the war industries" (as little as) "40 hours a week are those in the industries known as the necessarily continuous-process industries; some of the chemical processes, where you can not possibly speed up. . . . You have to wait for the chemical reactions to take place and you can not hurry things."

On the question of the length of the work week the Secretary said that "the possible maximum number of hours is 168. More than two-fifths of them" (various industries) "are operating over 160 hours per week and three-fourth of the war-production plants are carrying on the larger part of their work for 120 hours or more per week. All but 10 per cent. of the plants covered in our survey" (made among 650 employers) "were operating more than 70 hours a week."

Asked what prevented them from working 168 hours a week, these 650 employers reported, according to Secretary Perkins, "all sorts of reasons, the principal one being inadequacy or irregularity of supply of materials and another that they did not have sufficient amount of orders or regular flow of orders to warrant them putting their whole plant on 168 hours, which, you know, is a difficult program anyway. None of the 650 mentioned the overtime rates from 40 hours as being a deterrent."

The Military Subcommittee was so impressed by the facts revealed by Donald Nelson and Secretary Perkins that it demanded an investigation to learn the source of the misinformation and misrepresentation that have been circulated about labor's part in war production.

Mr. Nelson gave the subcommittee data on the number of hours worked weekly in various war industries and revealing how that number has been increased between last September and January of this year. The average work week in September 1941 was 51.4 in the machine-tool industry, in January 1942 it was 55.0 hours. In the engine and turbine industry it was 46.5 hours in September, 5.1 in January; in the aircraft industry it was 45.6 in September, 48.7 in January; in the shipbuilding industry it was 44.8 in September, 48.2 in January; in the machinery industry it was 45.1 in September, 47.1 in January; in the aluminum-manufacturing industry it was 42.4 in September, 45.9 in January; in the iron-and-steel industry it was 40.7 in September, 41.3 in January. Obviously the 40-hour-week provision of the Fair Labor Standards Act has not prevented expansion or lengthening of the average work week in these vital branches of war-production activity.

THERE are advantages in the 40-hour week, according to Nelson. On this subject he told the subcommittee in part: "The overtime pay which goes with the 40-hour week —time and one-half pay usually—probably has a good deal of value as an incentive to labor to put in the extra hours which are so necessary at this time. It is the equivalent of the premium price being paid industry for added output. . . . I believe that to abolish the 40-hour-week law would be harmful to our production picture. The extra money earned by the worker in war industries through the time-and-one-half provision has done much to counterbalance the increase in living costs. If we suddenly should abolish that extra earning we would create . . . strong demand for upward revision in wage rates so that the weekly rate can be kept."

During the testimony before the Military Subcommittee Senator Maybank read a statement issued by the National Association of Manufacturers and carried by the Associated Press that there had been a 208-per cent. increase in strikes in war industries in February and that they had cost 2,000,000 man-hours of work. Secretary Perkins presented figures showing that this claim was grossly exaggerated. The Senators agreed that the association should be asked to give the source of its data, and Chairman Truman threatened to investigate that organization if the Appropriations Committee failed to do so.

The questions involved in this dispute are too important to the national welfare even in peace time and reach too far down into the lives of millions of Americans to be left unanswered. They merit painstaking and honest investigation by those who have no private interests to be served. The American public, whose supporting opinion is so eagerly sought, has a right to know what pressure groups are behind this campaign of misrepresentation and what interests are being served by it. Until that information is forthcoming Congress, as well as the public, will do well to suspend judgment and defer action.

Drag-line and Special Dumpers Solve This Operator's Pit-to-Plant Problem

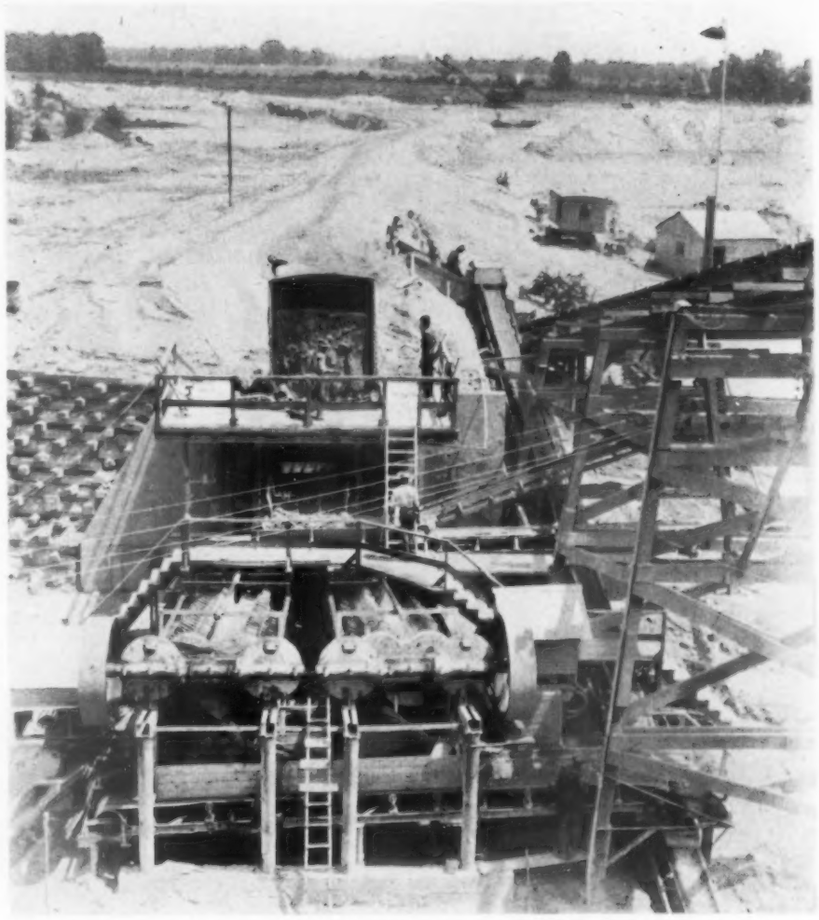
IN the late autumn of 1940 the Commonwealth Sand & Gravel Corporation, Norfolk, Virginia, was faced with the problem of dismantling its existing sand-and-gravel plant on the Darbytown Road, near Richmond, and building a completely new plant of 300-ton per hour capacity at the same location. Operations were scheduled to start in January, 1941, in order to supplement the supply of the corporation's ready-mixed-concrete plants at Norfolk and Newport News.

Speed was essential because of the vast amount of defense construction work for which these plants must supply concrete. And, of course, reliability of operation was equally essential.

The design and construction of the washing and sizing plant involved the usual difficulties of selecting, obtaining and installing various units of standard equipment of proper capacity, speed and dependability. The material to be washed and sized was an underwater deposit of sand and gravel, mixed with small amounts of clay, relatively easy to wash and size by widely-used methods.

But the excavation and transportation of this material from below water level at the pit to the stationary grizzly, an average of 2,200 feet distant, was not so easy to plan. Dewatering of the pit was thought of, although it would be difficult, as the water flowed in directly through gravel from the James River. Floating dredges, with and without washing and screening plants in connection, were considered and rejected for various reasons. Although there were several such plants in the vicinity, deliveries were uncertain and rehandling would be too involved, as all the shipments from the new plant were to be made over the Chesapeake & Ohio railway. Shovels were out of the question, as were drag shovels and back hoes, because the bottom of the deposit was 14 to 25 feet below the level of the water. Clam-shells offered possibilities but their effective digging area was limited and frequent moves would be necessary.

The choice finally narrowed down to a drag-line on account of its large digging area from a single digging position; its ability to load equally well into high hoppers or transportation units "spotted" over a wide area; its mobility; its usefulness for other occasional work, such as stripping over-burden



Looking down from top of screening plant. The log-washers, screen and special large-capacity dump truck are shown.

A general view of the washing-and-screening plant.

By SPENCER JONES

and doing rehandling; its relatively low cost; and (equally important) its prompt availability.

Koehring got the call and a Model 604 Koehring drag-line with 2 cubic yard bucket was ordered. High operating speed was one of the determining

The portable arc-welder which can be transported direct to the job for making repairs.

factors in the selection. E. L. Pleasants, general superintendent, stated that the drag-line was at times loading out approximately 250 cubic yards per hour. With a 2 cubic yard bucket this would mean that a complete drag-line cycle was taking 28.8 seconds. The weight of the material (wet, but minus drained-off water) was 2,700 pounds per cubic yard, or 5,400 pounds per bucketful—a total of 337.5 tons per hour. Even allowing for normal delays, this rate of digging provided more than ample material to keep the plant busy. The ordinary rate of digging was held down to a slower speed for various reasons.

Transportation from the drag-line to the plant offered plenty of choice. The problem was to deliver the drag-line's output (from variable locations) to the plant, which was 2,200 feet away along a right-angled dog-leg course. After considering a belt-conveyor with a movable hopper and feed belt, tram cars, trucks and tractor-trailer combinations, the finger pointed again to Koehring for this particular application.

Four W-60 Koehring Dumptors, with GM Diesel engines and extended tail gates to give 6 cubic yard water-level capacity, were ordered and put to work. Here, again, speed was one of the most important considerations. The fastest loading time under the drag-line was about 85 seconds to take on 3 bucketfuls, weighing approximately 7½ to 8½ tons—15,000 to 16,200 pounds of sand and gravel and the remainder of the water. The shortest turning and waiting time at the drag-line was about 15 seconds. The dumping time at the grizzly was about 15 seconds. This left only in the neighborhood of 240 seconds to cover the 4,400-foot round trip between the drag-line and the plant if the Dumptors were to keep up with the drag-line. The shortest round-trip time, including loading, traveling dumping, returning and turning, was a trifle less than 6 minutes for each Dumptor, or a load dumped into the grizzly every 1½ minutes, and sometimes every 1¼ minutes if necessary.

Allowing for acceleration and deceleration, this meant that the fastest running speeds along the dog-leg road were on the average, a little more than 14 miles per hour and the average top speed for a complete cycle was about 8½ miles per hour. Top speeds during hauling and returning were probably around 18 miles per hour. The haul road was soft around the drag-line, but of fairly hard and smooth gravel for about 1,800 feet each way. A ramp with a 10-per cent. grade extended for 250 feet up to the grizzly.

The dredging and transportation of the deposit was preceded by stripping of earth overburden to an average depth of 8 feet. This was done with a Class 14 Bucyrus steam-powered drag-line with a 60-cubic foot bucket, which cast stripped overburden back into the worked-over parts of the pit at the rate of 120 cubic yards an hour.

Steam drag-line stripping the deposit. The bucket has a capacity of 60 cubic feet.

Clam-shell rehandling stone at stock-piles. A similar model is visible in background.

Progress of the material from the time it leaves the Dumptors is through a stationary grizzly with 8- by 12-inch rectangular openings, assisted by powerful streams of water from hoses. The function of the grizzly is more to break clay balls and the lumps of blue marl on which the deposit rests, than to cause the rejection of oversize.

From the grizzly the mixture of sand, gravel clay, marl and water slides down a chute to a 5- by 10-foot single-deck F-600 W. S. Tyler Ty-Rock vibrating screen, with 3½-inch square wire mesh, powered by a 7½-horsepower General Electric motor. The material rejected by this screen is mostly lumps of clay and marl and falls off the lower end of the screen on the "mud belt," a rubber belt-conveyor 24 inches wide and 32 feet long, which carries the "mud" to a waiting truck. This "mud" is stock-piled and most of it used as base material for the haul road.

Material passing through the single-deck screen is chuted through a "Y" to

Dumping a 6-cubic yard load over grizzly.

feed two McLanahan & Stone 8- by 30-foot log-washers, each driven through V-belts and grooved pulley by a 75-horsepower General Electric motor. Major L. G. Thom, vice-president, general manager and chief engineer of the Commonwealth Sand & Gravel Corporation, states that his firm was one of the earliest users of log-washers, back in the days when the power needed to operate one was a matter for "educated guessing."

The material cleaned by the two log-washers falls down short chutes to a belt-conveyor 4 feet wide and 22 feet long, powered by a 3-horsepower Westinghouse motor, and is carried to a 24-inch belt-conveyor, 150 feet long, powered by a 15-horsepower General Electric motor. This 24-inch conveyor is also a re-circulating conveyor which is fed from a 6-inch Telsmith gyratory crusher driven by a 30-horsepower General Electric motor.

The 24-inch re-circulating conveyor carries the cleaned sand and gravel from the log-washers' discharge belt, as well as crushed material from the gyratory crusher, to a belt-conveyor 24 inches wide and 176 feet long, powered by a 15-horsepower General Electric motor. This latter conveyor takes the unsized material from the log-washers and the crushed material from the gyratory crusher and dumps them into a wash-box at the top of the sizing plant.

Drag-line loading one of the dumpers. Note hub-deep softness of the terrain.

The wash-box feeds a 5- by 10-foot F-600 W. S. Tyler Ty-Rock double-deck vibrating screen, powered by a 7½-horsepower General Electric motor. The material scalped off the 2⅛-inch square wire mesh of the deck slides down a chute into the 6-inch Telsmith gyratory crusher and are re-circulated as previously described. Material passing through the top deck, but rejected by the lower deck's 1-inch square wire-mesh screen, falls into the No. 4 bin, which has a capacity of 80 tons, feeds to railroad cars or motor trucks, and is used to store material for No. 4 aggregate stone.

Material passing through the 1-inch square wire mesh of the lower deck falls on another 5- by 10-foot F-600 W. S. Tyler Ty-Rock double-deck vibrating screen, also powered by a 7½-horsepower General Electric motor. The upper deck screen has ⅜-inch square wire mesh and material which this screen rejects goes off the end of the screen into another 80-ton bin from which cars or trucks may be loaded with No. 7 specification aggregate. Material passing through this ⅜-inch mesh upper screen, but rejected by the 5/32-inch screen of the lower deck, falls into a 35-ton bin from which cars or trucks may be loaded with No. 12 specification aggregate.

Whatever passes through the 5/32-inch mesh bottom-deck screen is classed as sand, falls through a launder into a 10- by 10- by 7-foot deep sump, and is pumped from the sump by a Georgia Iron Works sand pump, powered by a 50-horsepower motor, to two Telsmith sand tanks. The overflow from the sand tanks goes to the overflow pond and the de-watered sand goes to stock-piles, where it is re-handled as needed by two Northwest Model 105's, one a 31-cubic-foot clam-shell and the other a 1-cubic-yard drag-line. These two machines also work in the gravel stock-piles.

Roughly, according to Mr. Pleasants, the plant will produce about 90 tons of sand and 180 tons of stone and small gravel per hour. When visited, the plant

Assistant Superintendent R. F. Gibson and Superintendent E. L. Pleasants confer in the field.

was operating 20 hours per day, 6 days a week. The acreage owned or controlled by the Commonwealth Sand & Gravel Corporation assures a practically unlimited supply of material for future production.

There is also a very considerable area for the stock-piling of prepared sand, stone and small gravel beside the corporation's tracks, which are known as Twohy Siding, after John Twohy II, president.

Completed and ready to operate according to schedule in January 1941, the plant is a dependable source of supply for this firm's concrete plants which provide ready-mixed concrete at Norfolk and Newport News for America's foremost naval establishments—the Portsmouth Navy Yard, the Naval Operating Base at Norfolk and the Newport News Shipyard—and for its concrete plants in and around Richmond.

H. H. Harris is secretary and treasurer and E. L. Pleasants is general superintendent of the Commonwealth company. R. F. Gibson is plant superintendent.

Determination of Free Silica in Dust Is First Requirement When

ATTACKING THE SILICOSIS PROBLEM

THE term silicosis has been occurring with increasing frequency as industrialists, municipalities, government bureaus, public-health associations, insurance companies and labor in general have become aware of the subject and its implications. Much work has been accomplished in laboratories by a host of technical workers and the literature on the subject is voluminous. It is now well recognized that silicosis implies a condition brought about by the inhalation and retention of microscopic and ultra-microscopic duct particles containing various percentages, or consisting entirely, of silica. The medical profession has done a tremendous amount of highly commendable research and diagnostic work which insures a high degree of accuracy in the recognition and diagnosis of the disease. Silicosis (the word commonly used in describing the condition) is a recognized hazard.

Notwithstanding the tremendous advance that has been made in this field it is good to take stock of the situation and attempt to study the problem critically so as to make possible the intelligent application of preventive measures, to develop proper protection, and at the same time to maintain the highest possible economy consistent with a satisfactory solution of the hazard. There exists to-day an imposing bibliography covering many phases of the subject. The more one familiarizes himself with the detailed investigations and findings, the more evident it becomes that this topic presents problems that are tremendously varied in nature and which in many cases show completely contradictory evidence. Authorities in the medical profession are often in radical disagreement, not only as to the interpretion and findings from the results of investigations but in many cases disagree as to the causal mechanism. One school maintains that free silica is the most harmful of all dust particles. Another contends that sericite is of equal importance. Others claim that particulate dust of any description must be avoided in such concentrations where it can be deemed a hazard, regardless of its chemical composition. Most authorities are agreed that particulate matter above 10 microns in diameter can be disregarded and that attention should be given only to particles under this limiting size. Theoretically, the more minute the particle the more rapidly it is attacked in the tissues and the more active it becomes in causing silicosis. Even this is questioned by a few authorities in the field.

Since the problem is of vital import to industries where a dust hazard is involved it becomes highly important that these industries take immediate steps to recognize their own particular hazards and to become fully informed as to the dangers, possible means of correction and elimination, and proper protective measures, where workers are unavoidably exposed. In the present state of knowledge about silicosis it is evident that care must be exercised in order to avoid exaggeration of the dangers which would necessitate quite costly and possibly ineffectual precautions. Nor must one allow himself to be lulled into a false security by the many discordant statements and apparent confusion which exist. What industry must do is to meet this problem with clear concise tactics and deal with it intelligently and effectively so as to avoid costly experiments and tremendous outlays entirely out of keeping with economical operation.

In order to do this it is necessary to understand the problem and to be aware of the particular conditions which surround each individual industrial plant. Let us assume that silicosis is entirely, or in large part, due to the presence of free silica in particulate dust and that our present methods of diagnosis, post-mortem examination and medical knowledge are competent to discover and properly interpret the disease. Full knowledge of the amount of free silica present in the particular hazard to be corrected or guarded against is a necessity. It seems to be a well-established fact that certain dusts are not highly toxic due to their lack of free silica and that certain standards can be established which will offer highly economical treatments, where the materials are not in the dangerous class. Once having recognized the existence of a hazard and having established the fact that the free-silica content falls in the toxic group, the remainder of the problem consists of a properly directed attack to decrease the dust to the minimum and to offer the highest protection to exposed workers.

By JOHN J. SHANK
Director, The Wayne Laboratories

The first requirement in studying a dust hazard, under the conditions outlined, is to determine the presence and the amount of free silica in the dust. The particle-size distribution and other physical properties are also of importance. The methods of determination are somewhat limited and must be briefly discussed. Before a standard can be of any value we must have a suitable method for determination of the property for which the standard is to be established. Without this prerequisite any attempt to set up a standard and hold a product within its limits is ridiculous.

Methods The methods for identification and determination of silica in rock materials, as distinct from silicates, are practically limited to three procedures, namely, the chemical, the petrographic, and the X-ray pattern methods.

The chemical method is an empiric differential-solubility procedure and is capable of giving only rough approximations. The extremely-fine particles of free silica have been shown to be much more soluble than the larger particles and the rate of solution also is dependent upon the nature and strength of the acid used, the temperature, and the time of treatment. The method is not allowable in the opinion of dust-control and silicosis experts and is of value only for rough confirmations.

The petrographic method is admirably adopted to the problem so long as the great majority of the particles do not fall below 10 microns in size. The accuracy above this limit is excellent and the methods, while time-consuming, are well established and give good results. However, in silicosis problems we are definitely interested in that fraction of dust from 10 microns downward to the infinitely small. In this range the petrographic method becomes more and more useless in proportion to the decrease in size of the particles. Its accuracy diminishes rapidly and one is soon no better off than with the first method.

The X-ray pattern procedure offers hope of a more accurate answer. The work is relatively new, in the process

of development, and the meaning and proper interpretation of results have not yet been completely established.

One is faced, therefore, with the conclusion that any results on these fine materials can only be approximations and that the estimates may be relatively far from the truth. With this condition confronting industry in regard to the method of determination it is needless to go further for the purposes of this paper. The entire subject of silica-dust control in industry must be based upon a correct method of determination. Since it is admitted that some dusts are harmful and others are not, it is essential that industry obtain the necessary method upon which to base a fair standard.

It is a problem to establish certain standards for guidance and we must be vitally concerned in order to be sure that these standards are set up only after intelligent and proper interpretation has been applied to the facts. It is evident that the nature of each particular dust which is to be considered must be entirely understood. The chemical composition, not only qualitatively but quantitatively, must be known. It is here that care must be exercised so that the established standard does not imply severe restrictions on the innocent nor allow avoidance of responsibility on the part of those who deal with toxic dusts.

At present 5 per cent. of free silica in dust is proposed as the maximum in some industries. In industries where the dust consists entirely or in a large part of free silica this figure is not exorbitant. However, there are many industries where such a figure seems much too stringent in view of the facts which can be stated. Many minerals of industrial value contain silicate and other constituents which must be considered aside from the free silica. These are considered non-toxic. It is an accepted fact that silica counts under the microscope are always maximum. They are always too high and never too low. This is due to the impossibility of distinguishing between quartz and other minerals which are very similar under the conditions of examination of these fine powders. These similar minerals are in particular feldspars, halite, serpentine, chlorite, kaolinite, nephelite. mica, anhydrite and talc, all with indexes of refraction between 1.53 and 1.59. These are the most common, but approximately 240 such minerals are listed by Larson and Berman (Geological Survey Bulletin 848).

From this viewpoint the determination of free silica, no matter how carefully it is conducted, will always give results that are too high when working with minus 10-micron particles. These results will be even further in error when it is remembered that quartz is relatively much harder than the mica, chlorite and other minerals in the group and, therefore, will be more resistant to reduction to a fine powder. Theoretically this will result in fines and dust which become progressively poorer in free silica and richer in the so-called inert silicates, which however, will be counted as silica in the quantitative enumeration of minus-10-micron particles.

Summary 1.—There are at present three methods for free silica determination: (1) chemical, (2) petrographic, (3) X-ray.

2.—The petrographic method or some suitable modification is at present the only recommendation, even though somewhat inaccurate for these materials.

3.—Counts for free silica will be high due to the presence of similar indistinguishable minerals under 10 microns.

4.—In establishing a free-silica content for minus-10-micron particles this fact should be given consideration so that the limit is not placed too low. This necessitates knowing the mineralogical composition of each rock for which a standard is to be established.

5.—The actual content of free silica in the minus-10-micron fraction theoretically should be lower than the free-silica content of the parent rock. This may not hold true in practice for obvious reasons.

In conclusion it should be stated that the somewhat rambling discussion above has a very definite purpose. Industry must realize the necessity for careful study and control of dust hazards and must be vitally concerned with the proper establishment of various standards by which they are to be judged. Due to many imperfections in the methods and to the impossibility in many cases of making accurate determinations and distinctions for the toxic and non-toxic particles, it is obviously unfair to impose certain standards without taking into consideration other factors which, if properly incorporated, would serve to show the futility of maintaining excessively-low figures. As a concrete example, an operation producing large amounts of minus-10-micron dust, where the product being processed consists entirely of free silica, should exercise the closest control and hold rigidly to the lowest possible standard. On the other hand, such measures would involve unnecessary hardship on the operation in which the dust is largely composed of silicates and other minerals as separate and distinct from free silica. There is needed much intelligent coöperation between the various interested parties. Industry should sit in conference with the medical profession, the insurance companies and the laboratories. In this way, all working together, relatively fair standardizations could be established. If, and when, more accurate methods can be developed for the determination of free silica the requirements for each particular industry can be more closely and more fairly established.

Until such time, we must be constantly awake to the needs for protection on one hand and the dangers of improper requirements on the other. Silicosis threatens to become of major importance as a "racket" in the hands of labor, aided by unscrupulous attorneys, carelessly drawn standards and political maneuvering. Numerous silicosis cases have been settled or are pending in our courts. In quite a few cases they have been shown to be definitely "rackets" and the decisions reached have worked unfair hardship on the defendants. We must critically examine, study and learn to recognize this silicosis. We must be aware of the composition of the dust and know whether or not it can be implicated as a cause of a condition which may have been correctly diagnosed or which may not be due to the supposed hazard on which claims of damages are based.

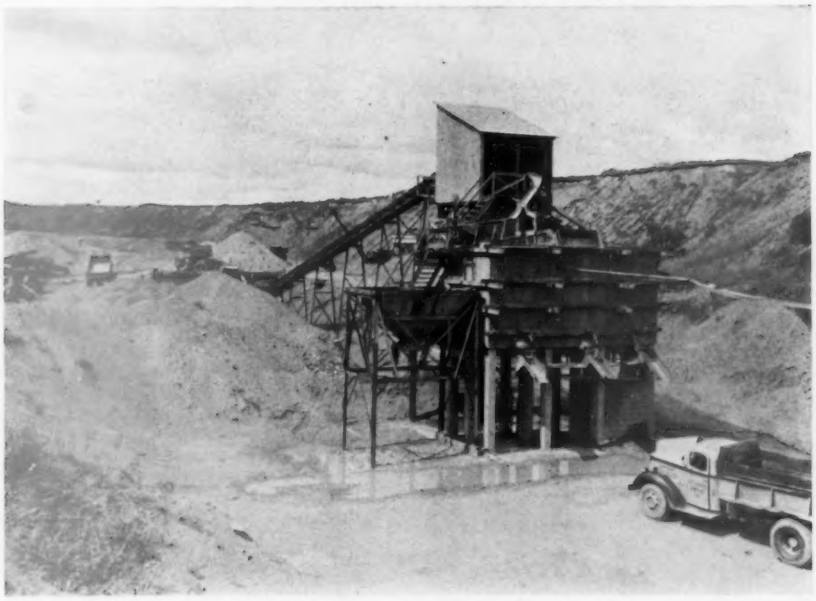
Show Patriotism by Insulating Dwelling

The home owner eager to "do his bit" in the national defense drive can combine patriotism and profit by fully insulating his dwelling, according to the Bureau of Mines in Washington.

In the bureau's Information Circular 7166, Paul M. Tyler, chief engineer of its nonmetal economics division, points out that the average fuel bill of $75 for heating a home in accordance with modern standards of comfort can be reduced to $40 with mineral-wool, vermiculite or other insulation, and that if similar savings could be applied to the 37,000,000 existing dwelling units in the United States, the potential savings would be about $1,000,000,000 a year.

Adhesive Lime Patent Granted Montreal Firm

A lime product known as adhesive lime was invented originally about ten years ago by an Italian named Agostino Pozzi, who, with the assistance of scientists has been gradually improving and developing the material to a high degree of efficiency. It has been patented practically all over the world, the parent company now holding 32 patents in 29 countries, with other patents pending. In February, 1941, United States Patent No. 2,230,761 was granted to Adhesive Lime, Ltd., of Montreal.



General view (left) of Ray Vogtli & Son gravel plant with pit in background.

Wet Chute Eliminates "Flats" from Gravel at Vogtli Plant

WHEN Ray Vogtli of Gowanda, New York, a town of about 3,000 population located in a fertile agricultural and orchard region 35 miles south of Buffalo, went into the sand-and-gravel business in 1927, he soon found that his sales volume was being held down by the fact that there were no contractors available to handle local construction work. As a result he began to do this work also and has developed a very substantial business. Among the large jobs erected by Ray Vogtli & Son are a $55,000 water-supply system for Angola, New York in 1935 and a $72,000 contract for 1½ miles of bituminous pavement which was laid in 1936. Recently a $22,000 county highway bridge at Sardinia was completed.

The sand-and-gravel business has also grown considerably since the small original plant was built. This was replaced in 1933 by a plant with conical revolving screens which produced 250 tons of gravel and 300 tons of sand in an 8-hour day. During the winter of 1939-40 this plant was replaced with the present plant, which has the same capacity but is much more efficient, compact and economical. Much better and cleaner aggregates are being produced by this plant.

The 32-acre deposit is glacial and is in a pocket of clay at the top of a high hill overlooking Gowanda. The material extends to a depth of 60 feet in places but the maximum depth of the workings is about 50 feet. The overburden averages about 4 feet in depth and this is removed by a ⅜-cubic yard Insley gasoline shovel which is also used at times to help load in the pit. Much of the overburden is sold locally for fill at 50 cents per cubic yard. Some is also sold for top soil. The same trucks are used to deliver this material and the sand and gravel. There is considerable variation in the deposit but it averages about 40 per cent. sand, and about 70 per cent. of the gravel is over 2 inches and up to 12 inches in size. In places the sand content is as high as 60 per cent. and the percentage of flat gravel is high enough to be a problem.

The company owns two ¾-cubic yard Koehring Number 301 shovels with Wisconsin gasoline engines. One of these is usually in use on a construction project while the other is used in the pit. These machines are convertible to ¾-cubic yard clam-shell cranes. One was purchased in 1933 and the other in 1934 and both have been very satisfactory. Every year they are checked over thoroughly and all possible precautions are taken to prevent expensive repairs and delays. This policy has paid dividends. Sometimes all three shovels are needed for construction work or stripping at one time. In this case the plant bins are filled and a large steel portable hopper in the pit is loaded so the trucks can feed this material to the plant if needed while the shovels are gone.

Most of the hauling to the plant is done by a 5-cubic yard Pierce-Arrow dump truck but some of the delivery trucks are sometimes called into this service. The material is discharged over a 12-inch-spaced bar grizzly into the plant hopper. A sliding gate controls the rate of feed on a short 26-inch belt-conveyor which feeds the 2- by 4-foot Niagara single-deck vibrating scalping screen. The plus-2-inch gravel is discharged into a 14- by 24-inch Universal Road Machinery Company "Reliance" jaw crusher.

Chutes leading from triple-deck sizing screen. "Flats" drop from center chute into spout below while salable material goes to bin.

Both the product of the crusher and the minus-2-inch material passing through the screen are carried on a 22-inch by 300-foot belt-conveyor to the top of the screening building. All the sizing is done by a 2- by 10-foot Screen Equipment Company 3-deck "Seco" vibrating screen. This has ⅜- and 1⅜-

Two sand wheels like this were designed and built by the company to make concrete and masons' sand.

Shovel loading overburden into truck.

inch openings on its full top deck, ⅜-inch on its half middle deck which is under the 1⅝-inch section, and ¼-inch cloth on its bottom deck. This rather unusual arrangement makes 1⅝- to 2-inch or New York State Number 3 gravel from the top deck, ⅜- to 1⅝-inch Number 2 gravel from the middle deck, and ¼- to ⅜-inch Number 1 gravel from the bottom deck.

The Number 3 gravel goes through a chute to a small shaker screen which insures the removal of plus-2-inch material before it is discharged into a bin compartment. The small amount of plus-2-inch material drops into another compartment from which a truck hauls it back to the plant hopper. The Number 1 gravel is discharged from the screen into still another compartment.

The Number 2 gravel is usually discharged from the screen through a steel chute into another bin compartment. When excessive "flats" are present, however, this chute becomes an efficient "flat" remover. It is so placed that all the gravel is ordinarily discharged into the above-mentioned bin. By the application of just enough water to keep the chute wet the flat gravel is made to adhere to the chute and slide slowly down it while the round gravel bounces on into the bin. The "flats" drop off the end of the chute into a wooden hopper placed directly below its end and on into a bin from which they are periodically hauled off to waste. When it is not needed, this hopper is turned on its side to close the opening to the waste bin.

The sand passing through the bottom deck of the screen usually goes direct through a chute into a sand-wheel of original design which makes concrete sand. This wheel consists of a 7-foot-diameter steel rim connected to a drive-

Triple-deck screen which does all the sizing.

shaft by steel spokes. Attached to the rim are angle irons which are so hinged that they will scrape a load of sand out of a tank and, when at the apex of travel of the rim, will flop over, dropping the sand over sloping plates on each side of the wheel into a bin. The gradual tilting of each angle-iron as it comes up out of the tank lets the water drain out slowly without appreciable loss of fine materials.

All shipments are made in trucks, usually within a radius of 25 miles. Re-

One of the two gasoline-powered cranes in the pit.

cently 6,000 cubic yards of material was furnished for a large defense construction project at Dunkirk, 30 miles from the plant. A fleet of six trucks is used for this work, including a Ford, a Chevrolet, a Mack and three General Motors machines. All shipments are weighed on a truck scale rebuilt by W. S. Meyer.

A gasoline engine drives the primary crusher through a flat belt and each of the two screens is driven by an electric motor through a V-belt. The main conveyor is driven by a 25-horsepower Fairbanks-Morse electric motor through a Philadelphia gear-reducer and the short feeder conveyor is driven by chain from its tail pulley. The wash water is obtained from city mains but, because of the elevation, the pressure is too low and a 150-g.p.m. booster pump with a 3-horsepower motor is used.

The 14- by 24-inch jaw-crusher with gasoline engine above.

Bentonite Production Shows Important Gain

War needs are boosting the use of bentonite and consequent production in the Black Hills area embracing eastern Wyoming and western South Dakota, the only area in the United States where high-grade ore is found in pure form. This production was up approximately 33 per cent. during the past year and production for this year is expected to be 50 per cent. over last year.

A large share of the recent increase in the use of bentonite is attributed to the clay's use in steel production where it is used in the foundry to replace fire clay in the mixing of molding sands.

A total of 4,422 carloads, or 145,900 tons, of bentonite was shipped from the Black Hills last year, of which Belle Fouche shipped 1,630 carloads, and Weston county, Wyoming, 2,782 carloads.

Price-Fixing and the Anti-Trust Laws*

Part I—Direct Price-Fixing Activities: Prices—Manufacturers' Groups *(Continued)*

By GEORGE H. SAGE
of the Chicago Bar

A3—Resale-Price Maintenance In addition to fixing prices for the manufacturers in the manufacturer group and controlling the resale prices of jobber-competitors of the manufacturers in the group, the manufacturer group may exercise control over the resale prices of simple distributors. These simple distributors may consist of wholesalers or retailers, or include both wholesalers and retailers, neither wholesalers nor retailers necessarily competing with the manufacturers in the group. Although this last type of price-fixing activity may thus appear to pass beyond the normal interest of the manufacturer group in the fixing of prices, the very reason for the activity may be the protection of the price structure of the manufacturer group itself.

This may become necessary as the result of intense pressure from the distribution stages. Although the manufacturers in a manufacturer group may, through the fixing of prices, have eliminated any price competition among themselves and, where necessary, any price competition between the manufacturers in the group and jobber-competitors, the wholesale and retail customers of the manufacturers may still remain engaged in the most intense price competition. The relatively large number of wholesalers or retailers, the price-cutting practices of numerous individual wholesalers or retailers, the organization of certain types of wholesalers or retailers in buying and reselling on a "cut-price" basis, and similar factors may have resulted in a "demoralized" market condition in the distribution stages. Experiencing too keenly the effects of the severe competitive price conditions, individual distributors may then importune their manufacturer-suppliers for special price concessions to enable them to withstand these conditions, or, if the distributors are retailers buying through wholesalers, they may importune for special price concession their wholesaler-suppliers who in turn may importune their manufacturer-suppliers. Thus importuned, individual manufacturers may finally accede to these increasingly insistent demands, granting special prices through secret or indirect means, especially where the individual manufacturers may harbor suspicions or doubts regarding the actual adherence of one or more manufacturers in the group to the prices fixed by the group. At first limited, this secret or indirect price-cutting may soon tend to become, in spite of efforts of the manufacturer group to prevent these breakdowns in the price structure, increasingly widespread among other manufacturers in the group acting in self-protection to maintain their dealer establishments. Even the influence of trade-marks or trade names in retaining some consumer patronage in spite of lower prices of competing branded products may be entirely insufficient to withstand the inroads on the volume of sales made by competing goods sold at lower prices. The price structure of the manufacturer group, strongly organized and operated to withstand any frontal attack from manufacturer or jobber competitors, may thus become seriously threatened through the turning of its flank on the part of competitive price conditions in the purely distributive stages of the industry.

Another reason, one of more vital importance to the manufacturers as individual manufacturers than to the manufacturer group as a group, for the exercise by the manufacturer group of control over the resale prices of wholesalers and retailers is the protection of the good-will possessed by the individual manufacturer in the trademarks or trade names covering the goods itself. Accompanying modern industrial conditions of "mass" or large-scale production has been extensive or widespread advertising of the goods produced in order to create or stimulate demand for the goods. As a result the branded products of a manufacturer may have developed wide consumer acceptance and full dealer coöperation and, in consequence, may flow readily through distribution channels to consumers. Exploitation of the substantial good-will property value in the particular trademarks or tradenames resulting from this consumer acceptance or dealer coöperation, however, may be sought in their own interests at the expense of those manufacturers by various individual distributors and certain types of "mass" distributors by such means, for example, as "loss-leader" selling, in which the established prices on the branded products are cut to undue low levels. The resulting confusion of the consuming public and restlessness and dissatisfaction of dealers generally may threaten to impair, if not destroy, the good-will value in the trade-marks or trade names.

Individual action, however, may have definite limitations, among which may be insufficient economic power to effectuate any plan; time, effort and expense in policing any such plan; and competition of products of other manufacturers. The coöperative effort by a manufacturer group, on the other hand, in establishing and maintaining resale prices for the products of the individual manufacturers on the part of distributors may appear to have many advantages in accomplishing more effectively the objectives sought without the usual accompanying limitations.

In establishing and maintaining a resale-price maintenance plan the manufacturer or publisher group, like the individual manufacturer, will employ one of the well recognized legal devices for this purpose. In the case of a direct price-fixing group the legal devices will generally be the contract and the refusal to sell. The plan may also have application to retailers only, wholesalers only, or both retailers and wholesalers, depending upon the channels of distribution of the manufacturers or publishers, the need for resale price maintenance, and the feasibility of such resale-price maintenance at the particular distribution stage.

The Agreement or Contract Device The agreement or contract device may be utilized by the manufacturer group as the basis for a plan of control over resale prices of retailers, wholesalers or both. A uniform form of agreement, for example, executed between the individual manufacturer and its individual wholesaler customers, may grant the individual wholesaler the right to purchase and sell the type of goods in question and provide for certain discounts and details as to shipments and deliveries. The agreement may then prescribe that resales are to be made by the purchaser at prices appearing in the schedule to be attached or in the price lists or sheets

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separately issued to the wholesaler from time to time. This requirement of resale-price maintenance may be made applicable not only to the goods purchased from the seller or other member of the manufacturer group but also to similar goods purchased from any manufacturer. The agreement form may also contain an exclusive-dealing clause providing that the purchaser during the life of the contract shall not purchase, sell, advertise or solicit orders for, or in any way handle or deal in products of any manufacturer not a member of the group except with the express written permission of the seller or the manufacturer group. For faithful observance of its engagements the wholesaler (the agreement may provide) will be entitled to rebates from its purchases payable at certain rebate periods but a breach of any of the requirements will subject the agreement and all unfilled orders to cancellation, the loss of the power to obtain goods from any of the manufacturers in the group, and the forfeiture of any rebates otherwise accruing. The price lists or sheets actually issued to wholesalers may contain a notice to wholesalers' salesmen that the agreement executed by their companies required them to resell the various products at no better prices, terms or other regulations than therein established.

In practice this uniform form of agreement may be forced compulsorily upon wholesalers as a condition to the sale to it of goods by any manufacturer in the group. Since the group may well control practically the whole industry, most individual wholesalers, threatened with denial of any supplies, may well execute the proffered agreement, thereby extending the control of the manufacturer group to the resale prices at practically the whole wholesaler stage of distribution.

Refusal to Sell Instead of the agreement or contract device as the basis of a plan of resale-price maintenance, the right of refusal to sell may be utilized by a manufacturer group. As the basis of a resale-price maintenance plan established by an economically powerful manufacturer acting individually, this legal device, derived from the right of any seller to select the customers with whom it will deal, may prove extremely effective, but as the basis of a resale-price maintenance plan established by a manufacturer group it may become most effective. While the distributor under a plan established by the individual manufacturer may have had, at least in theory, the alternative of competing sources of supply, it may have under a plan established by the manufacturer group no such practical alternative—if any, the alternative of going out of business. Any practical effectiveness absent in individual action may thus be supplied by group action.

The application of a plan maintained by a manufacturer group based upon refusal to sell can well be illustrated by the case of a group of book publishers seeking to maintain resale prices of copyrighted books, which also serves to illustrate the group establishment of a resale-price maintenance plan for the benefit of individual manufacturers in the group and protection of the goodwill value in their respective trademarks, trade names, or copyrights. Most of the book publishers in the United States, in numbers and extent of business practically controlling a particular branch of the book-publishing industry, may organize a publisher group to maintain the net resale prices of copyrighted books published by any one of them as designated by the publisher of each book through a "notice" appearing below the copyright notice of the book. In this group the member publishers may agree with each other to sell only to those retail book sellers who both maintain the prescribed resale prices and do not sell to price-cutting retail book sellers when notified of them by the publisher group, and to report to the central agency of the publisher group all cases coming to their knowledge of price-cutting by the retail book sellers. To implement the agreement the publisher group may aid actively the formation of one or more groups of retail book sellers, if such groups are not already in existence. These retail book sellers' groups, whether specially organized or already functioning as associations, comprising the great proportion of the trade in numbers and extent of business, may then coöperate actively with the publisher group in the maintenance of resale prices. Pursuant to such coöperation the retail book sellers may agree with each other: not to purchase, keep in stock, or offer for sale the books of any book publisher declining to support or coöperate with the resale-price-control set-up, any such book seller purchasing from such a publisher to be expelled from the association and denied books from other dealers at the dealers' discount; not to supply with books any dealer denounced by the publisher group for cutting the price of books and denied books by the publishers; to supply the publisher group with the names of book sellers cutting prices and not to sell any such price-cutting book sellers. In the operation of this resale-price maintenance scheme no book-publisher or book-seller member of either group may in fact sell at a dealer's discount to any dealer not observing the resale prices or to any dealer furnishing books to a dealer not observing the resale prices, the publisher and the book-sellers' groups may not sanction the sale of any books to any dealer known to be selling books below the resale price or to be selling to another dealer so selling, while the names of dealers determined to be selling below the resale price or to be selling to dealers so selling may in fact be circulated among all the publishers and book sellers in each group. The effect of some of the provisions in the above group agreement, it may be noted, may be the exertion of considerable pressure on independent publishers and non-adhering retailers to conform to the resale-price maintenance plan; upon independent publishers, through the agreement of practically all the book sellers not to purchase any books from any publisher not supporting the scheme; upon non-adhering book sellers, through the agreement of the publisher group not to supply such dealer or other dealers selling such dealers, and through the agreement of members of the book sellers' groups also not to sell such dealers or other dealers selling such dealers.

Accompanying a resale-price maintenance plan will generally be found more or less elaborate policing. One form may include the periodical publication to the manufacturers of the names of distributors cutting prices. For example, in the gasoline-distribution industry, characterized by widespread price-cutting among the filling-station operators, a group of gasoline refiners having set up a resale-price maintenance plan based upon the refusal-to-sell device may implement the plan by the organization of a "Fair Practices Association" to publish so-called "Market Surveys" and "Gasoline Purchases" indicating those filling-station operators selling below the market prices, thereby to enable suppliers to compel the filling-station operators, on threat of refusal to sell, to sell at the designated or "suggested" prices.

TRADE NOTES

The recently organized Kotal Company, headed by Howard B. Bishop of Summit, New Jersey, has acquired the business heretofore conducted by the Asphalt Treatment Corporation, New York City. The company, which moved into new offices at 52 Vanderbilt Avenue, New York, on January 1, manufactures a waterproofing agent for use on aggregates employed in asphalt highway construction and maintenance.

The Wellman Engineering Company has changed the location of its Chicago office to Room 1112, Merchandise Mart. John E. Carlson of the Williams Bucket Division of Wellman is in charge.

New Stock-Piling System Facilitates Loading of Fluxing Stone Into Boats

THE Marblehead, Ohio operation of the Kelley Island Lime & Transport Company is one of the most important plants producing blast-furnace fluxing stone for the steel industry of Ohio, Michigan and Western Pennsylvania. It is also a symbol of the progress that has been made in production methods in the last half-century. This plant's deposit, together with that at Kelley's Island, Ohio, has been worked for over 60 years to supply the steel industry. Dimension stone was first quarried for building purposes and was extensively used at various points on the Great Lakes from Duluth to Buffalo. In the production of this stone a large proportion was wasted as spalls which were unsuitable for building. With the building of blast-furnaces in Cleveland and

This view of Plant D shows the fluxing-stone stock-piling and reclaiming system. The crusher building is at the right.

By W. E. TRAUFFER

the Mahoning Valley a market for these spalls developed and soon became more important than that for building stone. The natural result was that after about 1890 the quarry developments pointed more and more toward the production of fluxing stone.

In the early stages of this development the fluxing stone was broken down to the desired size and loaded by hand. At one time about 1,000 stone breakers and loaders were employed. Later a small steam shovel was put in operation at the Marblehead quarry and the stone was delivered to what was then considered a large crusher—a Number 7½ gyratory. After some years this machine was replaced by a Number 9 gyratory crusher and at one time three machines of this type were operated. When the need for even greater capacity was felt, these crushers were replaced by a 6- by 7-foot Edison roll-crusher, which was used until 1932, when the company's present Plant D was built.

The foundations and in some cases, the skeletons of Plants A, B and C, which preceded plant D, are still in existence and these add to the impressiveness of the company's land at Marblehead. Also scattered about the vast worked-out sections of this property are the remains of old lime kilns. A lime plant with 15 vertical kilns is now being operated by the company at Marblehead.

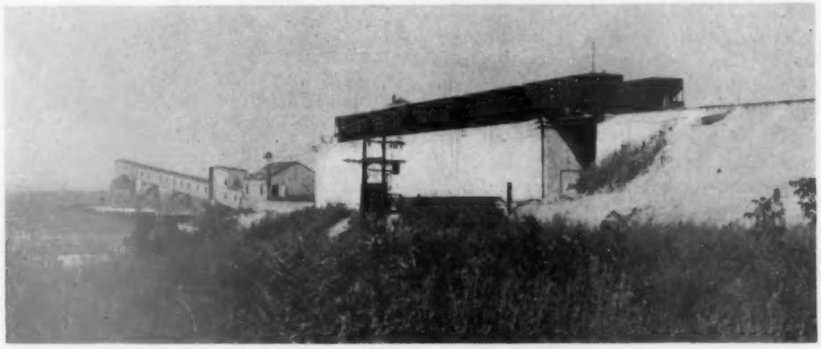
Few changes were made in Plant D until the fluxing-stone stock-piling system was installed early in 1940. These new facilities for the first time made it possible to take full advantage of the boat-loading dock which was built in 1928. The dock has a boat-loading capacity of 1,000 tons per hour but the plant-loading capacity was restricted to its productive capacity of 400 tons per hour of fluxing stone. When two 6,000- or 10,000-ton boats were being loaded at the same time they soon exhausted the 4,000 tons of dock-storage material and the 4,000 tons of car-storage material, and the completion of the loading had to wait on the plant production. With the stock-pile in operation boats can be loaded as fast as they come in and stone can be fed to the dock as rapidly as it can be loaded into boats. In April 1941, for example, 42 boats were loaded with only minor delays.

There has also been rather steady improvement in the quarrying practices employed, but until recently the transportation from the shovels to the plant had not kept pace. The Marblehead

This view of the stock-piling boom conveyor shows the counter-balancing weights.

operations for many years depended on steam locomotives hauling trains of ten or twelve 7-ton cars each. The movement of these trains over almost level tracks was extremely slow and the cost of keeping the large number of locomotives and cars in repair was very high.

Another frequent source of delay and



The boat-loading dock at Marblehead. The stone is discharged from the cars into bins from which the conveyor loads boats.

One of the fleet of nine 20-ton semi-trailers being loaded in the Marblehead quarry.

expense was the necessity for frequent shifting of the tracks due to the low face.

Late in 1940 a thorough study of the possibility of substituting trucks for the locomotives and cars was begun. After the analysis was completed a fleet of nine Easton Phoenix TR-15 semi-trailers of 20-ton capacity with Mack EQ tractors was ordered. Eight of these have been in operation since September 21, 1941, hauling stone from the Quarry to Plant D. These trailers are dumped

A trailer-load of stone being dumped into one of the two primary crushers.

at the primary crushers by automatic overhead hoists. The ninth truck-trailer which went into operation later, is a Model TR-15 H which is equipped for self-dumping so that it can be used in moving materials in other ways than direct from the shovels to the crusher. It can also relieve any of the other machines when necessary due to surges, greasing, maintenance, etc.

It was necessary to make truck drivers of the locomotive engineers of long service. It was not too easy for many of these men to adapt themselves to this new work but within a few days after changing over to trucks they were delivering more stone to the crusher with eight trucks from four shovels than had formerly been delivered by nine trains from five shovels.

The stone deposit, to a depth of about 20 feet, is so balanced chemically between calcium and magnesium carbonates as to be suitable for both blast-furnace fluxing and crushed stone. The overburden, which is very light, is removed by two small shovels and trucks. Seven Loomis Clipper well-drills and an Ingersoll-Rand wagon-drill are used, and blasting is done with du Pont EL 367 special explosive. Three 5-cubic yard shovels and a 4-cubic yard shovel are now in use.

The round trips from the shovels to the plant have varied from 1.5 to 3.2 miles in length and the truck-trailers have averaged 34 trips in an 8-hour day. Under winter conditions the trailer load has averaged 17.2 tons and each trailer has averaged 31 trips in an 8-hour day. This is an average of 533 tons per trailer per day. The roads in the quarry and to the plant are maintained by a grader and Caterpillar R4 and D4 tractors equipped with La Plant-Choate bulldozers and angledozers. At the crushers the trailers are dumped by Easton elbow-type dumping mechanisms, the dumping shock being borne by stabilizer feet resting on a steel-lined concrete wall. One of these feet is located at each end on the dumping side of a trailer frame. The old locomotive round-house has been converted into a garage for housing the truck-trailers, the tractors, and other equipment.

At Plant D the stone is dumped from the semi-trailers into the two 48-inch Allis-Chalmers primary crushers. Their 6-inch-minus product is carried by two Stephens-Adamson 60-inch inclined pan-conveyors to four Allis-Chalmers 60-inch by 24-foot revolving screens. Up to this point all the equipment is in duplicate and either half of the plant can be operated independently.

The 2- to 6-inch stone from these screens is fluxing stone and this forms about 400 tons of the plant's 530-ton

The type of drop-chute gates in the stock-pile reclaiming tunnel.

per hour output. It can be discharged either direct into four 500-ton car-loading bins or on a 30-inch by 80-foot collecting belt-conveyor. Each screen discharges only into one bin, and when the bins are full the stone overflows on this conveyor.

From the collecting conveyor the stone is discharged on the 30-inch by 120-foot first flight of the stock-piling conveyor system, which discharges it through a swivel chute, on the 30-inch by 100-foot stock-piling boom conveyor. Stone can be discharged from this con-

Some of the semi-trailers at the plant waiting to discharge their loads.

veyor at a maximum height of 80 feet above the top of the stock-pile reclaiming tunnel, and the boom can be raised and lowered to reduce the breakage due to dropping. The boom can be swung within an arc of 90 degrees. Separate hoists and motors for swinging and for raising and lowering the boom are located in the transfer building which supports its feed end.

The stock-pile was started by piling about 25,000 tons of stone in dead-storage sections which will never be

One of the two screens which make 1- to ½-inch stone.

touched. The actual live-storage capacity is about 25,000 tons and another 20,000 tons can be reclaimed with tractors and bulldozers.

Under the stock-pile are two 117-foot-long wing tunnels which are placed at an angle of 66 degrees 20 minutes with the main 262-foot reclaiming tunnel which parallels the stock-piling conveyor system. In each wing tunnel is a 36-inch by 109-foot belt-conveyor which is fed through 24-inch square openings with drop-chute gates in the top of the tunnel. Both these conveyors discharge on the 36-inch by 262-foot conveyor, which is also fed through

The 5- by 16-foot screen which makes agricultural limestone.

24-inch square openings and gates in its tunnel. Each of the two wing tunnels has an escape tunnel through one end of the stock-pile.

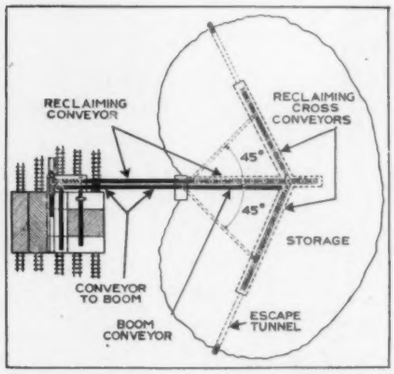
The stone from the main reclaiming conveyor is discharged on a Stephen-Adamson Type MAK 1-deck scalping screen, which is equipped with ½-inch wire cloth. This screen removes the dust, and the fluxing stone is discharged on a 36-inch by 38-inch shuttle belt-con-

The screen which removes dust from the fluxing stone before loading.

veyor with a travel of 26½ feet from which it can be dropped into three of the four 500-ton car-loading bins previously mentioned. The fluxing-stone output of the four revolving screens is 400 tons per hour and the capacity of the stock-pile reclaiming system is 600 tons per hour, making a total car-loading capacity of 1,000 tons per hour.

When boat shipments are being made the cars are hauled a distance of 3¼ miles to the dock, where the stone is discharged into reinforced-concrete bins with a capacity of 5,300 tons. A conveyor under these bins feeds the stone over a new Stephens-Adamson washing screen before it goes to the boat-loading conveyor.

The plus-6-inch stone from the revolving screens is discharged to a pair of Allis-Chalmers Number 8 Gates gyratory crushers. Bucket-elevators feed from these crushers to two pairs of revolving screens, which also receive minus 2-inch stone from the first four screens. These screens make 2- to 1½-inch and 1½- to 1-inch products which go to bins. Their minus 1-inch product goes to old shaker screens and two Symons screens which make a 1- to ½-inch product. The minus ½-inch material passing through these screens goes to a new 5- by 16-foot Seco screen which makes about 40 tons per hour of minus



Plan of new stock-piling and reclaiming-tunnel system.

3/16-inch agricultural limestone. About 30 tons per hour of ½- to 3/16-inch stone is made, and much of it is wasted.

The dock and stock-piling system together have increased the loading capacity at Marblehead to such an extent that the fluxing-stone quarry on Kelley Island has been shut down. Only riprap is now quarried there. Some riprap is also being produced at Rockport, Michigan, where the company operates a large high-calcium limestone plant producing chiefly open-hearth fluxing stone.

Warner Company's Executive Staff Undergoes Change

One of the leading concerns in the pit-and-quarry field, the Warner Company, Philadelphia, has made extensive personnel changes recently, streamlining its executive staff to meet economic conditions occasioned by the war.

Under this policy all production operations, including engineering and construction, in the Van Sciver, Terminal, Cedar Hollow, McCoy, Bellefonte, and Union Furnace plants, come under Irving Warner as vice-president in charge of production.

Management of the company's fleet on the Delaware River, all yards and central-mixed concrete plants, and all truck service, are delegated to Alexander Foster, Jr., vice-president in charge of distribution. His responsibilities will continue to include technical and specification work in connection with central-mixed concrete, sand, and gravel.

As vice-president in charge of sales, Reed C. Bye heads the new consolidated sales department, and Robert C. Collins has been appointed to the newly-created position of general sales manager to administer and coördinate all sales excepting those of the Bellefonte Division. George I. Purnell continues as general sales manager in charge of industrial and chemical lime and of the western territory, or Bellefonte Division. J. Dallas Dungan succeeds Mr. Collins as sales manager of the Philadelphia Division.

The growing importance of research and development work is recognized by the establishment of a new department which will be headed by Samuel M. Shallcross as director, who has relinquished his position as general manager of the American Lime & Stone Company. Its major function will be the development of improved as well as new products. Another function will be the analysis of operating statistics for the benefit of the executives.

By W. H. TAYLOR

Land-Pebble Phosphate Deposits of Florida—III

THE crude methods of river mining were replaced rapidly during the 1890's with hydraulic land mining. This change introduced labor-saving improvements steadily, chiefly by installing power-driven excavating, loading and haulage equipment, and, in some instances, by greatly increasing the capacity and efficiency of such equipment. Florida land-pebble deposits were uniquely suited to the use of large-scale hydraulic methods.

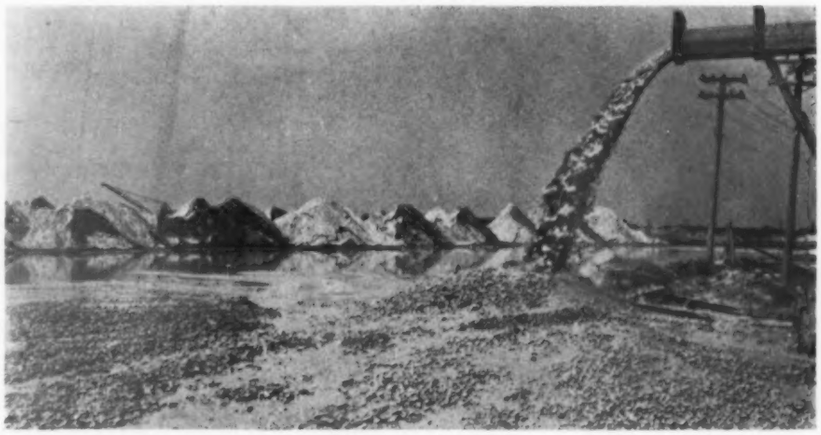
To appreciate fully the superior adaptability of land-pebble deposits to mass-production hydraulic methods of mining and transporting the matrix, it is necessary to consider briefly some of the differences between their matrix and that of other deposits. In South Carolina land-rock deposits the matrix usually averaged between 8 and 18 inches in thickness, and the phosphate rock occurred irregularly in sizes ranging from small grains to lumps and slabs several feet thick. In the Tennessee brown-rock deposits the matrix varied from a few inches up to 25 feet or more in thickness, and the rock occurred irregularly in pieces ranging in size from very fine grains to lumps and slabs 2 feet thick. The occurrence of Florida hard-rock is more or less deceptive, although as much as 1,500 tons of hard-rock has been mined from one bowlder, and a single acre sometimes yielded as much as 20,000 tons. The rock in adjacent plots might be scattered in small lumps, whose aggregate quantity would not warrant the expense of mining.

In contrast to the irregularities of other localities, the deposits in the land-pebble district occur comparatively regularly over large areas, and contain phosphate pebbles of more or less uniform sizes, ranging below 2 inches in diameter. Also, their content of waste materials nearly always occurs in pieces either larger or smaller than the phosphate pebbles, and can more easily be screened or washed out.

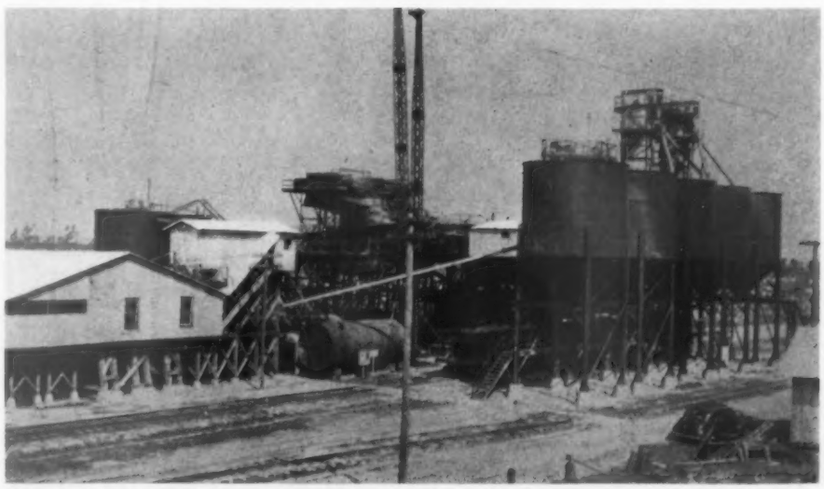
It was chiefly these unique natural advantages that enabled Florida land-pebble mines to introduce hydraulic methods of mining and transporting the matrix, and subsequently to develop them into mass-production operations unlike any others in the industry. The first hydraulic methods of mining and transporting land-pebble matrix similar to those employed to-day were introduced about 1902, along with the introduction of electricity to replace steam power. Their development was preceded by approximately a decade of experimentation with dipper and suction dredges, steam shovels, and other types of steam-driven excavators, supplemented by railroad haulage.

The gradual elimination of dredges from mining pits and the pumping of the matrix to washers on land simplified operations enormously, and all land-pebble mines soon adopted this practice. Further advances in mining and transporting land-pebble matrix resulted in large increases in the capacity and efficiency of centrifugal sand and water pumps, and of the engines and motors used to drive them.

Other improvements in matrix pumps, such as direct drives, flexible couplings, roller and ball bearings, replaceable end plates, larger and "streamlined" impellers, the use of metal alloys on the fastest-wearing parts, and the use of larger and longer-wearing pipe-lines with steel flanges, were important factors in improving operating efficiency and reducing the amount of the maintenance labor required in hydraulicking operations throughout the period. Two of the latest developments now being tried are a replaceable rubber-composition lining to protect the casing of pumps from the abrasive action of the matrix, and a rubber bellows hydraulic seal to keep the matrix away from the fastest-wearing parts. The first is being tried in the smaller tailings pumps around the



Mud balls containing phosphate, here being wasted, are now recovered with hammer-mills.

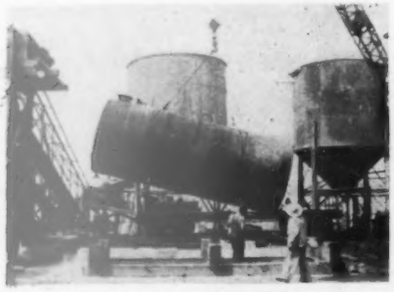


Duplex steel washing plant and recovery building at left. The steel derrick, center, was used in erecting the plant and will later be used in dismantling and reërecting at a new location.

washers, and the latter in the larger heavy-duty mining pumps used in the pits.

Some other material savings which have been made in mining equipment include the rebuilding of worn pumps and parts with electric welding machines and the introduction of alloy-steel pipe-lines in 40-foot sections.

Paralleling these changes in hydraulic equipment were other mechanical improvements in pit operations, such as the introduction of big crawler tractors to convey heavy materials from one place to another without delay. These tractors are equipped with heavy-duty quadrupled-geared single-drum winches for skidding 15- or 20-ton pit-pumping units quickly from one location to another, and making other heavy pulls which can not otherwise be accomplished. Some of the mining companies have equipped these tractors with steel booms mounted on the winch frames, which will pick up 5-ton loads and quickly transport them from one place to another, or load and unload

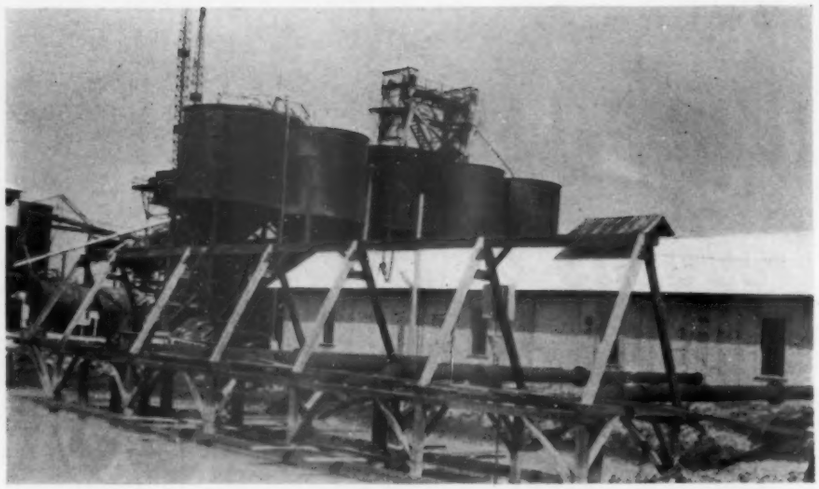


Derrick swinging 20,000-gallon reagent tank into position at recovery plant.

as the case may be. Such improvements in equipment have saved many hours of hard work for labor gangs, and at the same time increased efficiency while reducing costs.

At present the great majority of land-pebble matrix is mined and transported with equipment like that described above; but at one mine such equipment has been replaced by large electric drag-lines and locomotive haulage. The chief factor responsible for such a procedure in this case is the softness of the pebbles in this particular deposit. The attrition created in the pumps and long pipe-lines disintegrates a large portion of the soft pebbles which are lost in the slimes. There are no indications at present that drag-line mining and railroad haulage of land-pebble matrix would result in a net saving over hydraulic methods otherwise than in such deposits as this.

The formerly used wooden pit cars, on which were mounted small dredging pumps, motors and controls, weighed about 10 or 12 tons and were difficult to move from one location to another. They were pulled along slowly on skids and rollers with hand winches. These winches required 4 and sometimes 6 husky laborers to operate them, and accidents occurred frequently. About 6 more laborers were required to keep the skids and rollers moved ahead and to jack the car, which frequently jumped the track. This made a total of 10 or more laborers who required a full day or more to move a pit car 200 or 300 feet and couple it up ready for operation.



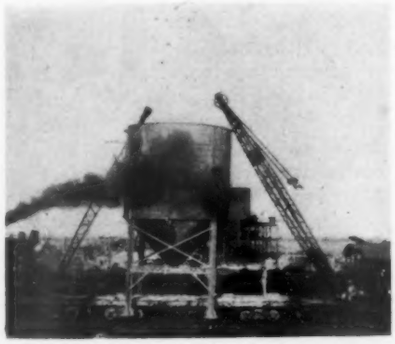
Hydraulic pumping station and suction sump hole. The water is used over and over again.

The suction, discharge lines, etc., were cut into small sections and moved by hand on horse-drawn wagons, which was a very slow and difficult operation. The heavy pieces were not easy to handle and, to add to the difficulties, the teams frequently bogged down while tugging at overloaded wagons in soft, muddy, pit bottoms.

These pit cars have been supplemented with solid steel fabricated units weighing from 15 to 20 tons and made similar to stone boats, so that they will easily slide along on the muddy pit bottoms, with the center of gravity so low that they will not lose their equilibrium and overturn while crossing ditches, etc. The small pumps and motors have been replaced with modern "streamlined" equipment of enormous capacities and high efficiencies. From 300- to 400-horsepower motors are used to drive big dredging pumps equipped with 36- to 38-inch runners. These pumps handle anywhere from 300 to 600 cubic yards per hour, varying according to requirements.

This modern pit-pumping unit, referred to as a pit car, is complete within itself, having the complete suction outfit suspended on an over-hung boom, which is fastened and anchored to the pit car with steel cables, which carry the entire load. This sturdy and up-to-date pit car can be moved from one location to another by a heavy tractor, equipped with a power winch, within a few minutes and coupled to another discharge pipe-line within a short time. Only about half the laborers formerly used are required with this equipment to do the same job.

The suction outfits suspended on overhung booms fastened to the pit cars have been simplified by having no foot valves, revolvable joints, or sump flexibles. A short all-rubber flexible is used adjacent to the pump, and the suction pipe is pulled up above the top of the pump with a small hand winch for priming. This set-up not only saves time, labor and equipment, but operates more smoothly and is easier to handle, all factors which figure strongly in the final unit cost of production.

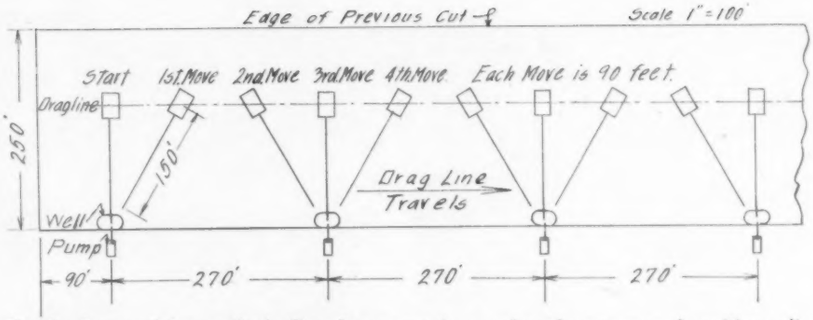


Two locomotive cranes moving one of the steel bins intact.

In order to facilitate mining operations two of these pit cars are generally used in one cut. While one is in operation, the second one is pulled ahead and coupled up ready for service immediately upon completion of the area being worked by the first one, and so on. In other words, these pit cars are alternated one ahead of the other in a series of successive moves until the cut is mined out. This system, al-

though employing double the amount of pumping equipment in the pit, practically eliminates the loss of operating time and, consequently, is a money-saver.

At present most of the mines are moving their pumping units to the ground surface, and feeding the matrix from the cut to them with drag-lines. This system has been so coördinated that it is now possible for a single big drag-line to remove the overburden and also transport the matrix from the pit to a pump on the surface in a cut 250 feet wide for a distance of 270 feet without moving the pump. In other words, a cut 1,800 feet long and 250 feet wide, covering more than 10 acres, can be mined out by moving the pump only six times. This simplified method of mining has cut the crews in halves,



Sketch of new mining method. Drag-line moves in a series of pre-arranged positions, digs matrix from cut and piles it in well to pump on the surface. As matrix is removed, the spoil is dumped in its place, saving hoisting and swinging. This procedure cuts operating costs and increases the output.

Pit pumping units being prepared for operation.

reduced the power cost, and increased the yardage handled to the extent that a material saving in the cost of production is being realized.

Some of these 12-inch heavy-duty dredging pumps have recently been equipped with 14-inch suctions, which has reduced the vacuum to the extent that a greater percentage of solids can be handled, thereby increasing the cubic-yards-per-hour output and decreasing the cost per cubic yard of material handled.

In addition to the extensive labor- and power-saving developments in mining the overburden and matrix, the Florida land-pebble phosphate industry has introduced equally important improvements in its washing and recovery processes.

The typical washing plants in the early 1900's were crude wooden structures with a limited capacity of about 20 tons per hour and usually produced about half that amount of the finished product. These washers were not only limited in capacity, but were extremely inefficient and seldom recovered more than 35 or 40 per cent. of the phosphate-rock content of the matrix.

Subsequent improvements tending to increase the recovery, the output per man, and the kilowatt-hour power consumption at these washing plant operations were: more efficient and larger-capacity pumps and pipe-lines; better preparation of the matrix before the washing and screening processes were begun; the use of additional and finer screens; increase in the capacity and efficiency of washing and screening equipment generally; and additional steps designed to recover smaller particles of phosphate rock that could not be separated by washing and screening. Better preparation of the matrix was accomplished by digging and piling it so that the hydraulic guns, with large capacities and high pressures, could rapidly disintegrate it and sluice it to the mining pumps.

In addition to this action, the churning and friction in centrifugal sand pumps and long pipe-lines leading to the washers gave it much additional scrubbing. The smallest size of screen openings has been reduced at all mines from about 3/64 to less than 1/32 of an inch.

The capacity and operating efficiency of washing-plant equipment has been extensively increased at all land-pebble mines. The output per washer hour has been increased roughly from 20 to 100 tons per hour at some of the mines during the past 20 years. Part of this increase in capacity was the result of approximately quadrupling the amount of matrix handled per washer-hour, and part was the result of recovering a greater percentage of the phosphate-rock content of the matrix. Paralleling these changes in capacity were a multitude of mechanical and structural alterations in land-pebble washers contributing toward greater recovery, a cleaner

Close-up view of one of the 2-inch hydraulic nozzles. It is designed to produce cutting jets of water which do not spray under high pressures.

Three 14-inch spiral-welded pipe-lines leading from pumping station to mine.

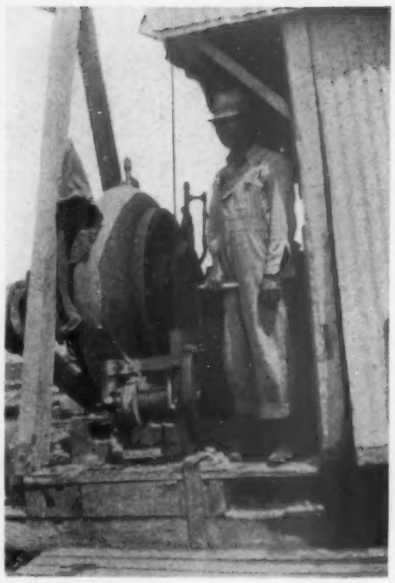
product, easier maintenance, greater safety of workmen, and economy of labor and power. Among the most important of such changes were more washing and screening steps, finer screens, mechanical and electric vibrating screens, revolving-drum and vibrating-spray scrubbers, cone and rake classifiers, structural steel instead of wood framing, individual geared drives instead of long shafting and belt and chain drives, automatic motor speed controls, improved belt-conveyors and elevators, steel cone-bottom storage bins, and steel tanks and launders to replace those of wood construction. Whereas the washer of 20 years ago, except for

The 15-ton pit car showing suction line suspended from boom.

its metal parts, was built largely by workmen at the mines, the modern steel washer is almost entirely a prefabricated product and requires relatively little mine labor in its construction. Besides reducing the amount of labor and power per ton required to maintain and operate washing plants, these improvements have increased washer recovery 50 per cent.

The predesigned fabricated-steel

A close-up view of the suspended suction line.



Operator at hand winch which raises and lowers the suction line seen in the pictures at left and below.

washing plants are riveted in sections by the manufacturers, and are bolted together in place on concrete foundations, which have been poured well in advance by mine labor. These details are carefully worked out in collaboration with mine and steel-company engineers in order that blue-print plans can be followed without the slightest delay in construction. These duplex washing plants are so designed and erected that each unit (consisting of a separator, flat screen, washer logs, trommel screens, vibrating screens, crushers, dewatering cones, reclaiming screens, belt-elevator and storage bin) can be operated individually. As many of these units as desired, which is ordinarily two, can be paralleled to meet existing conditions and requirements of production.

The leaner the deposit—which means more mud to be encountered — the larger and more elaborate the washing plants have to be in order to be able to handle enough cubic yards per hour of matrix to produce a paying tonnage of finished product. When the area adjacent to one of these washing plants has been mined out, the washer can be quickly moved in sections and reërected in a new location by locomotive cranes, which are capable of lifting and transporting 20 tons each. Frequently these cranes double up on heavier loads, which saves time and speeds up completion of the job.

One of the major problems confronting some of the mines at the present time is the loss of 4 or 5 tons per hour of high-grade phosphate rock in the mud balls, which are screened out in a revolving separator or vibrating scalping screen. These mud balls are portions of the sticky matrix that the draglines have dug up and the hydraulic guns and pumps have failed to disintegrate. They can not be handled by the washers without contamination of the finished product. Experiments are now under way to determine a satisfactory method of disintegrating these mud balls and recoving the material that is being lost.

The complete disintegration of 25 or 30 tons per hour of extremely-sticky mud balls is no easy job. Crushers, log-washers, ball-mills, and hydraulic scrubbers have all failed to do the job satisfactorily. One company has recently installed a large hammer-mill weighing about 20 tons and equipped with an individually-driven and slowly-moving breaker plate, which apparently is doing the job very well. More of such machines will likely be installed in the future, if the cost of installation and operation is warranted by the amount and grade of recovery.

Research to Improve Barium Products

A new way to prepare barium chloride or barium nitrate from barite and calcium chloride or calcium nitrate, respectively, was described by R. Norris Shreve and H. F. Wiegandt in a paper presented before the annual meeting of the American Chemical Society in September. The method involves the double decomposition in concentrated solutions of the barite and calcium salt to form anhydrite and the soluble barium salt and subsequent heating of the mass at high temperatures to convert the slightly soluble anhydrite to less reactive "insoluble" form. The reacted mass is cooled, and the soluble barium salt is extracted with aqueous methanol. More than 90 per cent. of the barite has been converted to soluble salt. Water may be used to extract the barium chloride or barium nitrate from the reaction mass, but considerably more decomposition takes place.

The present method of producing barium chloride or barium nitrate from barite involves preliminary reduction to sulphide by roasting with powdered coke. The barium sulphide is leached from the reaction mass, and calcium chloride is added to form barium chloride and a precipitate of calcium sulphide; or nitric acid is added to form barium nitrate with the evolution of hydrogen sulphide. It will be noted that the new method is much simpler than the old method, the soluble barium salt being produced in one step instead of requiring two separate chemical reactions. The process has not yet reached the commercial stage, but plans are being pushed to commercialize the development, according to the Bureau of Mines.

ASTM Groups Take Emergency Action on Specifications and Test Methods

THE 1942 A.S.T.M. Committee Week held in Cleveland, March 2 to 6, was featured by numerous emergency actions on important specifications and test methods. More than 520 technologists active in the materials fields attended various committee meetings held throughout the week. Some committees reported their sessions as the most productive in a number of years. Practically all the 150 meetings were well attended and this was particularly notable in such fields as steel, rubber products, petroleum and road and paving materials.

In addition to a review of the status of its *Symposium on Significance of Tests of Concrete and Concrete Aggregates,* a revision of which is being issued, Committee C-9 on Concrete and Concrete Aggregates, at its Cleveland meeting, acted on a number of important standards and approved for transmission to letter ballot certain new standards.

The symposium essentially is to bring up to date the publication issued several years ago which contained very valuable and authoritative information on the subjects covered. Twenty of the authors of reports given in the symposium have virtually completed their work and the material is to be referred to the entire committee for approval. Five other reports are nearly completed and these will be balloted on before final acceptance. The resulting publication will be of great value in this particular industry.

As in many fields of materials, standard definitions are extremely important and new ones covering water-cement ratio, flat piece and elongated piece (aggregates) and a revised definition of blast-furnace slag will be issued.

A new proposed standard for determining air content in fresh concrete will be recommended to the Society. This is particularly important because of rapid developments in the use of grinding aids which introduce or entrain air in concrete.

Another new test will cover procedures for measuring the length of concrete cores drilled from structures. There has been a great deal of work done in this field. The committee has studied methods used by some of the state highway departments and the Public Roads Administration has cooperated extensively in the work. It is planned to publish in the annual report of the committee a discussion and information developed by the Public Roads Administration which is the basis for the new procedures.

Another new specification will cover waterproofed paper for use in the curing of concrete. This is to be referred to the Society's standing Committee on Paper and Paper Products but action is proceeding in Committee C-9 so that the standard can be approved at the June meeting. Several other matters were discussed at the meeting including a proposed method for determining surface moisture in fine aggregate. Drafts of this are to be studied further. Another matter under study is the proposal that in making sieve analysis of fine aggregate limits be set up for the amount of material imposed on any one sieve—in other words, to avoid overloading a particular sieve.

Another of the committee's widely used specifications covering Ready Mixed Concrete (C 94—41 T) is to be revised with the section on description of terms clarified, covering ready-mixed, central-mixed, shrink-mixed and transit-mixed concretes, and other clarifying changes. One of the changes to be made in the section concerning physical strength involves a footnote stating that it is desirable that at least 90 per cent. of all strength tests be equal to or greater than 90 per cent. of the specified strength. It is stated that this requirement is impractically rigid unless a considerable number of specimens is involved. Based on work under way the committee hopes by June to propose further revisions dealing with this broad and important question of the number of tests necessary and desirable to evaluate properly the quality of the material and also the concordance of the test.

A number of standards are to be revised, some editorially, in the interest of clarification. In the Test for Unit Weight of Aggregate (C 29 — 39) there will be incorporated more exact specifications on the weight of the cylindrical metal measure used. Some of these have been made unnecessarily heavy. Minor changes will also be set up for immediate adoption in the Methods of Making and Storing Compression Specimens (C 31) and Test for Compressive Strength of Concrete (C 39), and changes to be adopted at the annual meeting will be offered in the Method of Test for Cement Content of Hardened Portland-Cement Concrete (C 85).

In addition to editorial changes in the Standard Specifications for Concrete Aggregates (C 33 — 40) references will be incorporated to the Los Angeles abrasion test but most important are grading changes which are being incorporated covering fine aggregate requiring more material finer than 50- and 100-sieve size, especially when used for leaner mixes.

In addition to the meeting of the main committee, sessions were also held by eleven of the subcommittees of Committee D-4 on Road and Paving Materials during the week. Considerable progress was made on a number of subjects included in the present program of work of the committee. Such matters as the extraction and recovery of constituents from bituminous mixtures, the study of viscosity and flow tests, emulsion tests, and solubility test methods were considered; also the development of tests for expansion joint materials, and further consideration of abrasion tests and other methods for determining the structural properties of mineral aggregates. Several minor revisions were recommended in the Tentative Specifications for Materials for Stabilized Base Course (D 556 — 40 T) and for Materials for Stabilized Surface Course (D 577 — 40 T).

The committee also approved, subject to letter vote, proposed revisions in the present ASTM Standard Methods of Test for Determination of Bitumen (D 4 — 27) and for Proportion of Bitumen Soluble in Carbon Tetrachloride (D 165 — 27). The changes will clarify the scopes to indicate that the tests are intended for determining bitumen in materials containing at least 25 per cent. bitumen; also a further amplification of the procedure in case there is some question involving the amount of mineral matter which may have passed through the filter. Reference will also be added to a procedure that may be followed in the event that there are water soluble salts present which are insoluble in carbon disulfide.

Action was also taken to revise the Tentative Specifications for Crushed Slag for Bituminous Macadam Base and Surface Courses (D 487 — 41 T) in line with the recommendations on standard sizes of coarse aggregate for highway construction.

Minor editorial changes recommended in the Standard Methods of Test for Softening Point of Tar Products (Cube-in-Water Method) (D 61

—38) and for Softening Point of Bituminous Materials (Ring-and-Ball Method) (D 36 — 26) were approved. In the cube-in-water test, the revision comprises the addition of the double mold for preparing the asphalt cube specimens, the present method illustrating only the single mold. In the ring-and-ball test the range of the thermometer is being changed from "30 to 160 C." to read "30 to 200 C." to agree with the requirements for the softening point thermometer in the ASTM Thermometer Specifications (E 1 — 39).

The abrasion test for aggregates has been the subject of considerable study in the committee, including the use of the Deval machine for the abrasion of rock and also for the abrasion of gravel, a test for toughness of rock, and the Los Angeles abrasion test for coarse aggregates. In 1939 the Los Angeles Abrasion test was adopted as standard and the following year the Deval test for abrasion of gravel was withdrawn as a tentative method. Further study of this subject has indicated that the Deval machine is still being used and the committee took action to recommend that this method be again published by the A.S.T.M. as tentative.

A number of standardization and research activities in the field of gypsum and gypsum products were discussed at the meeting of Committee C-11 on Gypsum with definite action on a number of points. In its work on testing methods the committee is investigating different procedures that have been proposed for determining particle size of gypsum products in the range of 40 microns and smaller; the committee will cooperate with a number of other groups, particularly A.S.T.M. Committee C-1 on Cement and also with the Technical Committee on Particle Size.

The standard specifications for calcined gypsum for dental plasters (C 72) which cover three grades—quick, medium, and slow setting—provide requirements for time of setting, tensile strength, and fineness, and the committee now proposes that there be included requirements for compressive strength. These values will be set up as tentative revisions and published for a year or more for comment.

As a result of detailed consideration of existing standards covering gypsum wall board (C 36), gypsum lath (C 37) and gypsum sheathing board (C 79), changes are being proposed. The gypsum lath specifications cover material of three thicknesses: ¼, ⅜, and ½ inch —and now requirements for $\frac{5}{16}$-inch thick lath will be established. The requirements in this standard cover flexural strength, weight and related matters.

Since wall board is available in various edges—that is, V, tongue and groove edge, as well as square edge, revisions will be incorporated in the specifications for recessed edge material. Requirements on size and variations are to cover a 24-inch width board, in addition to the 32, 36, and 48-inch now covered, and also, an increase in normal length will provide that instead of the present 4 to 12 feet, inclusive, it shall be 4 to 14 feet inclusive. The sheathing board specifications will omit all reference to ¾-inch thick board and also to the 32-inch width material.

Based on considerable work a proposed test method for determining purity of gypsum and calcined gypsum by the ammonium acetate method was published in the 1940 A.S.T.M. *Proceedings* on the recommendation of Committee C-11. The committee now is proposing that there be included immediately in the standard test methods this procedure as an alternate to the present gravimetric methods. The alternate method will cover determining calcium sulfate by extraction with ammonium acetate solution.

Another project in the test field is to cover procedures for determining water permeability of gypsum sheathing board.

While many controversial opinions have existed concerning important technical points which would need to be covered in tests and specifications for mortars for unit masonry, persistent work on the part of A.S.T.M. Committee C-12 which functions in this field resulted in a decision at the Cleveland meeting to submit to letter ballot for publication as a tentative standard, specifications for mortars for concrete unit masonry. Such structures would normally be built with concrete units conforming to Specifications for Hollow Load-Bearing Concrete Masonry Units (C 90 — 39), Hollow Non-Load-Bearing Concrete Masonry Units (C 129 — 39), and Solid Load-Bearing Concrete Masonry Units (C 145 — 40).

Three grades of mortar are covered as follows: (1) where a high degree of resistance to weathering is desired and where masonry is subjected to high stresses; (2) where a moderate degree of resistance to weathering is desired and where masonry is subjected to ordinary stresses; and (3) where weather resistance is a minor factor and low stresses are applied to the wall.

The properties of the materials are covered by existing A.S.T.M. standards —cement. lime, etc. There are requirements on water retention, compressive strength, and proportioning. For the three grades indicated above the average compressive strength at 28 days of three 2-inch cubes of mortar shall not be less than the following: Grade SW—2500 p.s.i.; Grade MW—600 p.s.i.; Grade NW—250 p.s.i.

Research work being carried on by the committee will be continued including investigations on the effect of total suction and rate of suction on the strength and bond of mortars. Methods of measuring plasticity and workability of these materials will also be studied in addition to the flow-table method on which considerable work has already been done.

Explosion Hazards Studied by Bureau

Analyzing combustible gases and vapors in mines and industries, preventing explosions in underground conduits that might destroy transmission lines carrying power to vital defense industries, studying the causes and control of mine fires, and testing "permissible" explosives for safe use in mines were among the outstanding technical investigations undertaken or completed by the Explosives Division of the Bureau of Mines last year, according to Dr. R. R. Sayers, Director of the Bureau.

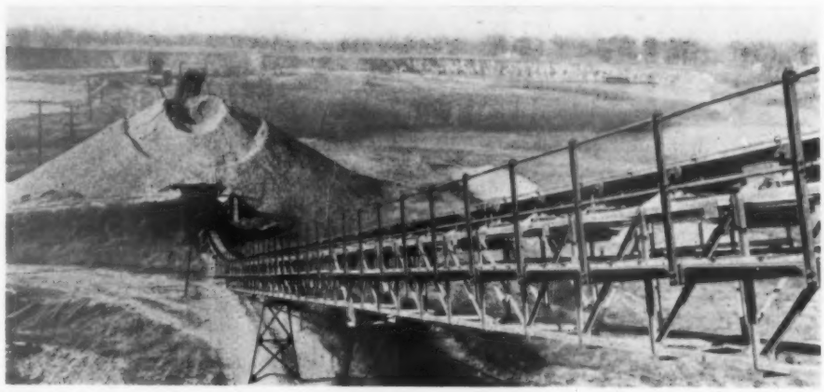
Since the mineral industries consume approximately 72 per cent. of all the industrial explosives manufactured in the United States, the prevention of mine accidents involving explosives has been a chief concern of the Bureau of Mines since 1910, Dr. Sayers stated. Investigations of a technical nature have been conducted throughout the years to determine the properties and safety characteristics of various types of explosives.

While mine safety has been the primary objective, the scope of such investigations has been widened in the last two or three years to include a great many factors directly connected with and important to national defense and war program, Dr. Sayers said in transmitting to Secretary of the Interior Harold L. Ickes the annual report of the Explosives Division for the fiscal year 1941.

For instance, in analyzing the explosion hazards of various combustible gases in mines and industries last year, the Bureau technologists devoted considerable time to a study of butadiene, a gas employed extensively in the manufacture of synthetic rubber. Laboratory tests were made to determine the upper and lower limits of inflammability of butadiene when mixed with oxygen. The information gleaned from these tests and from other experiments probably will be useful in promoting safety in the synthetic rubber industry which, in the crucial months to come, is expected to play an important part in helping America and the United Nations win the War.

Increase in Plant's Capacity Takes Full Advantage of Raw-Material Stockpile

WHEN the Wabash Sand & Gravel Company of Terre Haute, Indiana in 1934 installed a Robins belt-conveyor system for feeding from its hydraulic dredge to its processing plant several purposes were achieved. It made possible economical operation of the dredge at greater distances from the plant. The excess sand was disposed of at the dewatering station where the dredge-line discharged on the belt-conveyor system. The raw-material stock-pile, on which this conveyor system discharged, made it possible to operate the dredge and plant independently. A substantial increase in the capacity of the plant also resulted because of the steadier feed and the fact that the rate of feed to the plant was no longer affected by the location of the dredge or the variations in the deposit.



The conveyor from the raw-storage pile to the plant. In the background is the dewatering and desanding station and at right is the dredge.

This view of the new sand-and-gravel crushing and screening plant shows its simplicity of design and facilities for direct car-loading.

The dredge then used was built in 1921 and the plant a year later. The dredge was rebuilt and equipped with a new steel hull in 1940, but no important changes had been made in the plant since it was built. The dredge was able to supply an average of 200 tons per hour of material to the raw-material stock-pile and the old plant was able to process this material at a slightly-higher rate. When the present rearmament program began, however, this extra demand made the existing plant capacity inadequate. The company was faced with several alternatives but, after due consideration, it was decided to replace the old plant with a new and larger plant. This was done during the winter of 1940-41. Under the present arrangement the dredge is operated 20 hours daily to keep the plant going for 10 hours at its capacity of about 400 tons per hour. This is possible because of the 1,500-ton live-storage capacity of the raw-material stock-pile.

The new steel dredge hull was built by the American Steel Dredge Company. It is 64 feet long by 26-feet wide and was made in three sections which were assembled at the plant to form three water-tight compartments. The superstructure of the dredge has a structural-steel framework with steel-plate siding, steel-sash windows and a corrugated-metal roof. All the wiring inside the dredge is in overhead conduits. The priming pump and the transformers are also in overhead positions. Only the hoist, instrument panels, grids and the dredge pump and its motor are on the floor of the dredge and the grids are to be moved overhead this winter.

The 50-foot Eagle Swintek screen-nozzle ladder from the old dredge was rebuilt. It is supported from a double A-frame on two steel pontoons. A 3-drum American hoist operates the

This view shows the 600-foot long conveyor from the dredge line with the 80-foot span bridge over a creek. In background is the stock-piling conveyor.

By W. E. TRAUFFER

The rebuilt dredge with its new sectional steel hull and 50-foot screen-nozzle ladder supported from a double A-frame on two steel pontoons.

ladder and two shore lines. This ladder digs to about 40 feet below the water level and a small jet is used to cave down the 35-foot bank which includes two feet of overburden.

The 12-inch manganese-steel, heavy-duty centrifugal dredge pump has been equipped with a Pettibone-Mulliken rubber wear-resistor ring, the design of which originated at this plant. One of these wedge-shaped molded-rubber rings is automatically compressed between the pump casing and each side liner. It completely seals this opening and reduces wearing of the pump shell around the bolt ring. It also prevents the formation of eddies and increases

The gyratory crusher which reduces 1½- to 2-inch gravel.

the hydraulic efficiency of the pump considerably. According to officials of the company the use of this ring increases the life of a pump shell about 50 per cent. When worn out, the pump shells are built up by welding.

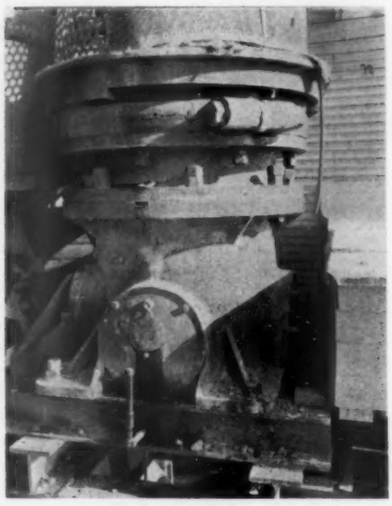
The dredge pipe-line is now about 800 feet long. The floating sections are carried on steel-barrel pontoons and are connected with rubber sleeves. The stationary sections on shore are connected with manganese-steel flanges which are peined to them.

No changes have been made in the design or location of the dewatering and de-sanding station since it was built in 1934. The dredge pipe-line discharges into a steel-lined chamber from which the water and material flow over two decks of gravity screens with ⅜- and 5/16-inch openings. The top deck serves as a protection for the lower deck which makes the actual sand separation.

The oversize material from both decks drops into a 30-cubic yard bin from which it is discharged through a gate on a 42-inch by 20-foot flat picking belt-conveyor. The chert, soft stone and small quantities of lignite present in the deposit are removed at this point. An extra set of rollers near the discharge end of this conveyor depresses the belt enough for most of the water to drain off to a flume.

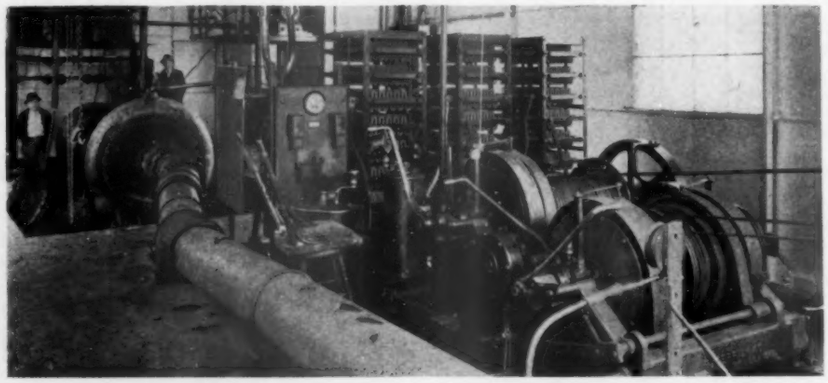
The sand and water passing through the bottom stationary screen drop into a 60-cubic yard bin which also serves as a settling tank. Any desired percentage of the sand can be wasted by allowing it to overflow the tank into the flume which leads to a worked-out section of the deposit. The sand content of the deposit varies from 50 to 70 per cent. and at times nearly all is wasted. The settled sand is discharged from the bin on the main field belt-conveyor forming a cushion for the gravel which is discharged from the picking conveyor at a point farther along the field conveyor.

The field conveyor is 24 inches wide and 600 feet long and is mounted on a steel framework supported on concrete footings. At one point it crosses a creek on an 80-foot span steel-truss bridge. This conveyor is equipped with Hamilton belting. At its discharge end it is inclined slightly to discharge on a 24-inch by 158-foot inclined conveyor from which the material is dropped on the stock-pile.



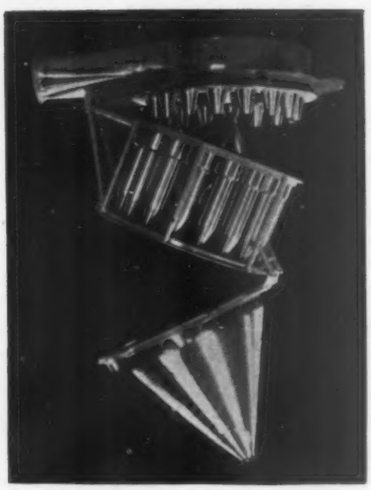
The Number 4 gyratory crusher which reduces plus-2-inch gravel.

The raw-material stock-pile has a total capacity of 4,000 tons, of which about 1,500 tons is live storage reclaimable through a concrete tunnel under the stock-pile. The five openings in the top of this tunnel are equipped with lever-operated gates through which the material is discharged on the 24-inch by 333-foot belt-conveyor to the top of the new plant. This conveyor is horizontal inside, and for about 45 feet beyond the end of, the 100-foot long tunnel and is



This interior view of dredge shows the 3-drum hoist and the 12-inch pump. The grids behind the hoist are to be moved overhead.

Recover strategic materials to meet production requirements



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inclined for the remainder of its length. Quaker City belting is used on it.

The sand and gravel are discharged from this conveyor on a 5- by 12-foot Robins Eliptex 2-deck screen equipped with 1-inch and Number 4 cloth. The oversize material goes to a 4- by 10½-foot Eliptex 2-deck screen with 2- and 1½-inch openings; that from the top deck of this screen goes to an Allis-Chalmers Number 4 McCully gyratory crusher. The material passing over the bottom deck of the second screen goes to a Traylor Type TY gyratory crusher. The 1- to 1½-inch gravel dropping through the bottom deck of this screen goes to a bin. The products of both crushers are fed back to the first screen by a bucket-elevator.

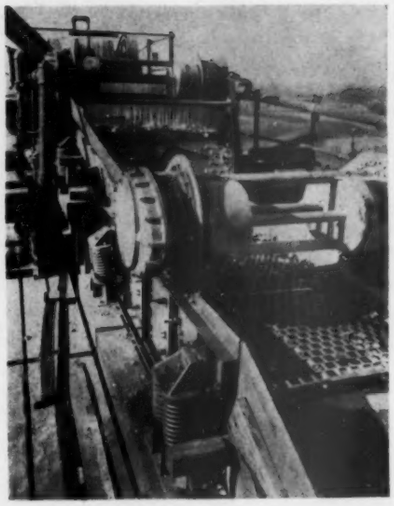
The gravel passing over the bottom deck of the first screen goes to another 5- by 12-foot Eliptex screen with ¾- and ½-inch openings. The three products

The vibrating screen which makes three small sizes of gravel.

made by this screen are discharged into separate bin compartments or they can be combined with each other or with any of the other sizes produced.

The fine material and water dropping through the bottom deck of the first screen usually go into a pair of tilting-type sand tanks of the company's own design. These make concrete sand which is discharged into a bin compartment. When finer sand is desired the material from the screen goes to a 4- by 6-foot Deister Machine Company single-deck screen with ⅛- or 1/10-inch openings. In this case the material passing over the screen is grits. The fine material dropping through it goes to a third tank from which the masonry sand is discharged into a bin compartment.

Some changes in this crushing and screening lay-out are to be made this winter. Another 5- by 12-foot Eliptex 2-deck screen and an Allis-Chalmers Number 322 Type R reduction crusher will be installed. This screen will increase the screening capacity and make possible the more-efficient production of a greater variety of sizes. The crusher will provide for the reduction of the 1- to ½-inch gravel of which there is



The two vibrating screens which scalp sand and oversize.

sometimes an excess. It will be located so that any size from 1½-inch down to ½-inch can be fed to it and its product will go to the same elevator as that of the present crushers or into bins.

The new plant is built entirely of reinforced concrete and steel and has seven bins with a combined capacity of about 200 cubic yards. The crushers are mounted on the steel frame-work and are cushioned with rubber to reduce vibration.

About 10 per cent. of the plant output is delivered in trucks and these shipments are weighed on an 18-ton Winslow truck scale. The railway shipments include most of the commercial demand plus over 500,000 tons which were supplied during the past year for the Burns City, Indiana, ammunition depot.

An old steam locomotive crane is used for the small amount of stock-piling done at this plant. When masons' sand is produced this is stock-piled to drain and is later loaded into bins for truck or car loading. Stock-piles of some of the larger sizes of gravel are maintained so that this material can be run back through the plant when needed. This material is loaded into trucks and is discharged into a hopper over the plant belt-conveyor.

The company's operations are located just north of the Terre Haute city limits where they have been since the company was founded in 1905. L. F. Hart, general manager, has been with the company since 1919. J. E. Johnson has been superintendent since 1916, when he succeeded his father in this position. All the improvements that have been mentioned in this article were made under their supervision by the company's forces. The company also operates a sand-and-gravel plant at Montezuma, Indiana.

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Fast-Moving Crane Helps Speed Up Shipments at Gregg Plant

IN THE heart of the San Fernando Valley deposit of commercial aggregates above Burbank, California, John D. Gregg has brought his important commercial gravel plant completely up to date by adding a new Model LS-85 Link Belt-Speeder Zephyrcrane. Mr. Gregg expects his new machine to increase the storage space on the plant premises, to load new storage bins recently erected, and to serve as a fast, mobile hoisting unit wherever it is needed.

These factors are potential advantages in favor of this plant whose 8,000-ton maximum daily output is distributed regularly to war construction and civil works near Los Angeles. The Gregg plant has grown in its seven years of operation until now it ranks as one of the most important producers of commercial aggregates in the area. Thirteen different sizes of material, ranging from 4-inch stones down to fine plaster sand, pass through its scientifically-manipulated screens and washing devices. Everywhere around the main plant and scale house are high stock-piled cones of material, lying where they have dropped from endless conveyor belts.

From these stock-piles have come the aggregates for such magnificent structures as the Hansen and Sepulveda Dam spillways, visible from the plant on a clear day. Highways, buildings, dams and bridges have all passed through the Gregg plant. When defense construction reached a new peak in 1941, Mr. Gregg and Superintendent Phil Flynn outlined a construction program in which the purchase of the Zephyrcrane figured importantly.

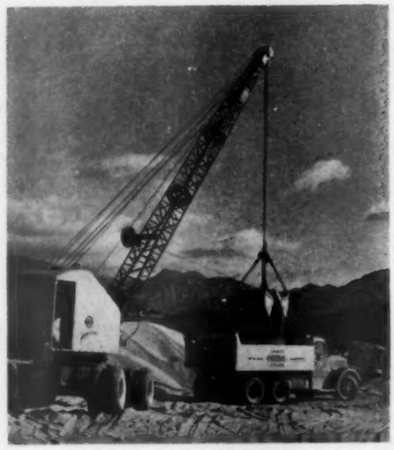
One of the chief disadvantages of the old system was that of loading out stock-piled material directly to the trucks by a crawler crane. When five or six different grades of material were being loaded, most of the crane's time was spent in moving at slow speed between the different trucks as they arrived at different piles. Valuable truck time was lost while they waited for the loading unit to move.

So Gregg and Flynn decided to erect structural-steel storage bunkers at strategic points over the grounds, wherein different sizes of aggregate could be stored and loaded into trucks by the truck drivers themselves. The bunkers, holding perhaps 25 loads of material each, could be serviced by the new crane as the supply ran low. In this manner the crane could very nearly load a whole bunker before moving on to the next one. The new system made each move count for about 20 truck-loads instead of from 1 to 5 loads under the old system.

With the new bunkers installed during the past few months, business is now booming on a 24-hour per day basis. The Zephyrcrane, swinging an Owen clam-shell, is now showing up to its best advantage in loading out from 45 to 60 cubic yards of different-sized aggregate per hour. The machine is mounted on a special Maxi (Six Wheels, Inc.) chassis, providing for rapid movement between loading points at the will of the machine operator. The underpinning has two forward speeds. The low speed of 6 miles per hour is generally used around the plant roads and passageways, but in high gear the machine will travel 12 miles per hour.

According to Plant Superintendent Flynn, the use of the new crane is so vital to its operations that the company can afford to take no chances on preventable breakdowns. Spare brake lining, tools, fuel, grease and accessories are always in easy reach. Taking a tip from other up-to-date concerns, Mr. Flynn has even equipped all his cranes and shovels with the best quality preformed rope he can buy.

"It's a good investment," he said. "Preformed rope certainly wears longer, it handles easier, it stands more abuse, and every time I save an hour in the life of these hoist and holding ropes I figure it's just that much more metal saved for a bomb-shell or some other vital piece of war material."



The special crane loading bunkers and one of the delivery trucks.

Job performance records showed an increase in service life of hoist, holding and clam-closing ropes of about 30 per cent. over the non-preforming type which was used some years ago.

But this is only one example, however, of the precautionary system carried in effect through the whole plant. The whole idea is to prevent a general plant shutdown due to breakage of some essential unit. In the pit, for instance, the main conveyor belt which carries raw material up to the screens in the plant is fed by two other drag-lines and shovels. If they should break down the plant would be forced to cease operating due to a lack of raw material, even though nothing whatever might be wrong with that machinery. To take care of this problem Superintendent Flynn had bins installed along that conveyor line with enough capacity to run the plant for 2½ days. They are kept full at all times by one of the machines, and are seldom called upon to do service. But if they are ever needed, they are there.

A general view of the Gregg operations near Burbank, California.

PERSONAL MENTION

JAMES J. ARQUILLA, South Side Cement Block Works, was the first Chicago resident to be allowed to purchase a new automobile under the rationing program. Mr. Arquilla was qualified because his work involves highway maintenance and the car is to be used solely for that purpose.

E. W. MANDIGO, sand-and-gravel producer of Grand Island, Oregon for several years has formed the Grand Island Corporation and is enlarging his operations. New firm members are J. R. MCKAY, H. B. RUTH and R. C. SKINNER.

CHARLES WASSON, foreman at the Bonner Springs, Kansas plant of the Lone Star Cement Corporation, has resigned to become district business representative for the Cement, Lime, Gypsum and Allied Workers' Union. He will cover the states of Kansas, Nebraska and Oklahoma.

EDWIN H. BROWN, formerly manager and chief engineer of the engine and condenser department, has been elected a vice-president of the Allis-Chalmers Manufacturing Company, in charge of engineering and development.

FRANK E. TOWN, superintendent of the Manitowoc Portland Cement Company, has been elected president of the Manitowoc Chamber of Commerce.

G. VAN VALKENBURGH, since 1928 general manager of the Blue Rapids Gravel Company, Blue Rapids, Kansas, has retired. His successor is FRANK KAUL.

GORDON L. CRAWFORD, previously sales manager of the Buffalo district of the Wickwire Spencer Steel Company, has been made assistant general sales manager with headquarters in New York. He will continue as sales manager of the company's structural products division.

WILLIAM A. WITHINGTON, former superintendent of the Standard Portland Cement Company, Leeds, Alabama, and more recently with the Universal Atlas Portland Cement Company, passed away March 9 at Natchez, Mississippi. Mr. Withington was born in Charleston, South Carolina in 1869. In 1904 he was sent to Leeds to erect a plant for the Standard Portland Ce-

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No special wrench
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ACCIDENTS SAVED

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CLIPS SAVED

Fewer rope breaks
ACCIDENTS SAVED

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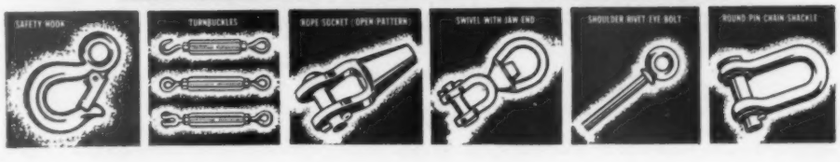


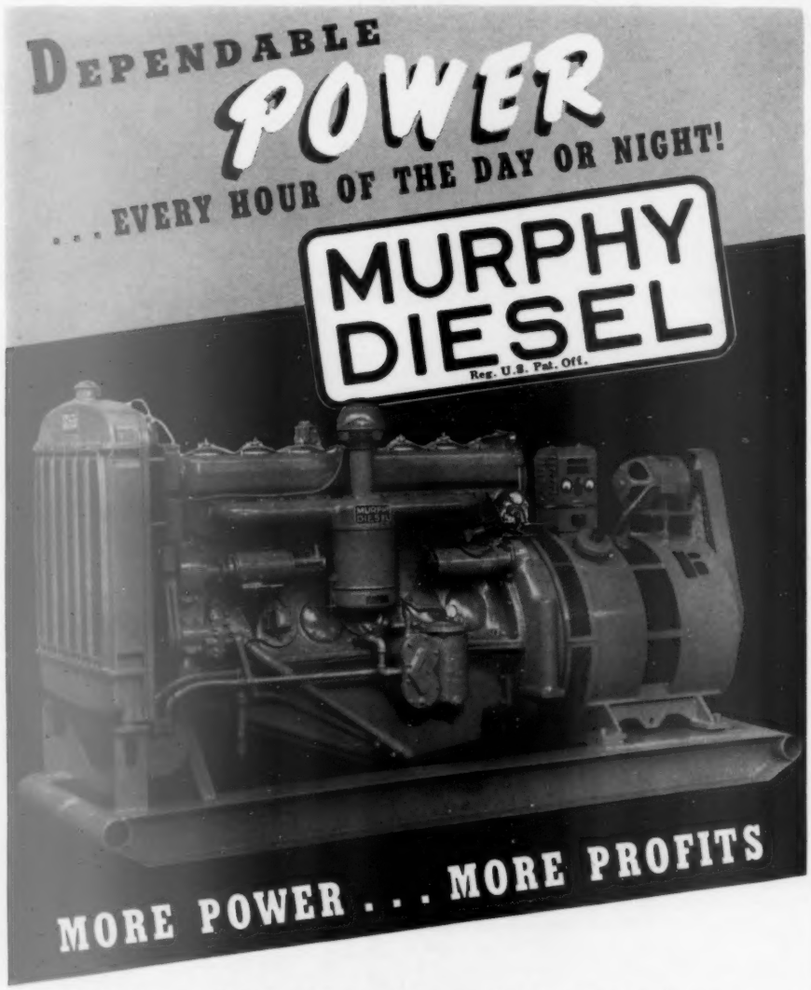
ment Company. When, several years later, the plant was acquired by the Universal Atlas Cement Company, he was retained by the new owner as local purchasing agent, a position from which he retired six years ago. While living in Leeds, he served for a number of years as alderman and several terms as mayor.

Ray L. Williams, 55, service manager for the Marion Steam Shovel Company for 31 years, died suddenly of a stroke of apoplexy March 5 at his home in Marion.

Levi C. Peacock, 63, head of the Richmond Gravel Company of Richmond, Indiana, died February 28 after an illness of three months. He had been in the gravel business for a quarter of a century and served a term as county surveyor about 30 years ago.

James W. Williams, 80, retired operator of slate and cement companies, died February 11 at his home in Easton, Pennsylvania. Thirty years ago he formed a cement company which was later sold to the Alpha Portland Cement Company. He also was a former president of the Ventnor Slate Company, which he helped form, and was the inventor of one of the first coaster brakes for bicycles.

Edward T. Fishwick, vice-president and director of the Worthington Pump & Machinery Corporation, died on March 15 at his home in Glen Ridge, New Jersey.



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TRAFFIC News Digest

I. C. C. Reports

Crushed Stone.—Fourth-section application No. 17907. Crushed stone from New York. By Division 2. Authority granted by F. S. O. 14542, on conditions, to establish and maintain rates on crushed stone, from Akron and other western New York points to destinations in New York, Ohio and Pennsylvania, without observing the long-and-short-haul part of the fourth section. Relief was authorized temporarily by F. S. O. 13468, and the rates proposed were established July 15, 1939.

Sand.—Fourth-section application No. 18723. Sand to Decatur, Illinois. By Division 2. Authority granted by third supplemental F. S. O. 14020, on conditions, to establish and maintain rates, by the net ton, on sand, to Decatur, Illinois, of not less than 63 cents from Attica and Montezuma, Indiana, and 72 cents from Riverton, Indiana, without observing the long-and-short-haul part of the fourth section. Temporary relief was given by F. S. O. 14020, as supplemented, to expire June 28, 1942.

Cement.—Fourth-section application No. 18862. Cement from Birmingham, Alabama, to Harriman, Tennessee, embracing fourth-section applications Nos. 18999, 19058, and 19097. By Division 2. Authority granted by F. S. O. 14518, on conditions, to establish and maintain, a rate of 17 cents on cement, concrete mix, and masonry cement, from Birmingham, North Birmingham, Leeds, Boyles, and Phoenixville, Alabama, to Harriman, Tennessee, as to which temporary relief was given by F. S. O. 14113, as supplemented without observing the long-and-short-haul part of the fourth section.

Crushed Stone.—Fourth-section application No. 19327. Crushed stone from Security, Maryland. By Division 2. By fourth-section order No. 14525. Authority granted, subject to conditions, for the establishment of rates on

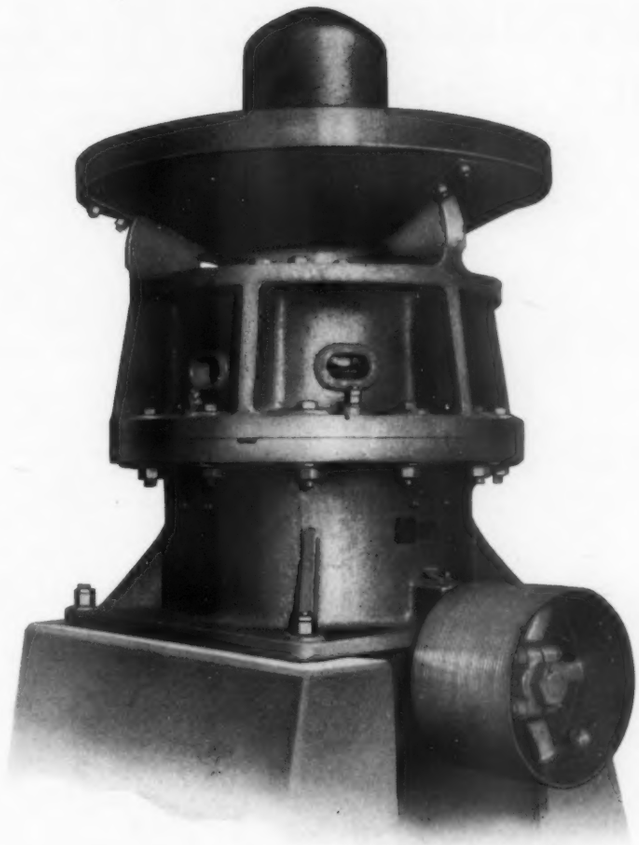
crushed stone over the B. & O. single-line routes from Security to Garrett, Meyersdale, Rockwood, and Sand Patch, Pennsylvania. The rates the same as those contemporaneously in effect on like traffic from Security to the same destinations over the single-line routes of the Western Maryland, but not lower than rates of $1.32 to Garrett, Meyersdale and Sand Patch, and $1.43 to Rockwood. The rates from and to higher rated intermediate points shall not exceed the rates constructed on the basis approved or prescribed in Cumberland Cement and Sand Company *v.* B. & O., 151 I. C. C. 183, plus authorized general increases, or exceed the lowest combination of rates.

Lime.—Fourth-section application No. 18488. Lime from the Southwest to the South, embracing fourth-section application No. 19068, lime from Mosher and St. Genevieve, Missouri, to the South. By Division 2. Authority granted by F. S. O. 14546, on conditions, to establish and maintain rates on lime in carloads, from producing points in Arkansas, Kansas, Louisiana, Oklahoma, Texas and Southwestern Missouri to destinations in southern territory, including Memphis, Tennessee, and the Mississippi River crossings south thereof, except destinations in southern Florida, also from producing points in eastern Missouri to the aforesaid destinations, except the river crossings, without observing the long-and-short-haul part of the fourth section. The rates are to be constructed on the basis of the distance scale of rates prescribed or approved in National Mortar & Supply Company *v.* Pennsylvania Railroad Company, 216 I. C. C. 75. Temporary relief was given by F. S. O. 13907, but, according to the report, the applicants have not availed themselves of the temporary relief, except from Mosher and St. Genevieve, Missouri.

Motor Reports

Saratoga, Wyoming.—MC 59030, Sub. 2. Clarence Shaw, dba Saratoga Truck Line, extension, cement. Joint board 50. Certificate recommended. Cement, from Boettcher, Colorado to points in Wyoming within 40 miles of specified highways; and general commodities, with exceptions, between Laramie and Saratoga, Wyoming.

Claysville, Pennsylvania.—MC 57616, Sub. No. 1 T. G. Walker, common-carrier application. Examiner E. T. Cosby. Certificate proposed. Cinders, slag, sand and gravel, and stone, unglazed or unmanufactured, from Board Tree, Burton, Hundred, Littleton and Cameron, West Virginia, and Claysville, Taylorstown, Vienna and West Alexander, Pennsylvania, to points in Greene and Washington Counties, Pennsylvania, over irregular routes.



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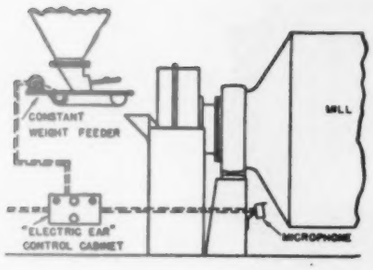

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Lanesville, Indiana.—MC 102278, Sub. No. 1. Lorena T. Messin, contract-carrier extension. Examiner John L. Bradford. Permit proposed. Lime from Milltown, Indiana, to points in Illinois, Kentucky, and Ohio, over irregular routes.

Portsmouth, Ohio.—MC 96321, Charles Mitchell, common-carrier application. Joint board 37. Certificate proposed. Sand, gravel and asphalt-coated aggregate from points in Scioto County, Ohio, to points in Kentucky within 50 miles of Portsmouth, Ohio, over irregular routes.

Hayden, Colorado.—MC 102841. Grant A. Simonton, dba Simonton Truck Line, common-carrier application. Joint board 50. Denial of certificate recommended. Plaster, cement, lime and its products, from Laramie, Wyoming, to points in Colorado.

Springfield, Ohio.—MC 102678. G. H. Brunk, contract-carrier application. Joint board 60. Permit proposed. Lime from Durbin, Ohio, to points in Indiana.

Central Freight Association

Docket 69838.—(Shipper's proposal). Stone, crushed and screenings, in straight or mixed carloads, or visible capacity, actual weight will apply. Establish a rate of 85 cents per net ton from Hillsville, Shaw Junction, and Walford, Pennsylvania, to Conneautville, Pennsylvania via the P. R. R. direct. To expire June 20, 1942.

Docket 69840.—(Shipper's proposal). Stone, crushed in carloads. Establish a rate of $2.28 per net ton from Meyer, Indiana, to Milwaukee, Wisconsin. Also a rate of $2.16 per net ton to Racine and South Milwaukee, Wisconsin.

Docket 69857.—(Carrier's proposal). Sand, except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica, in open-top cars, or gravel in all kinds of equipment in carloads. Establish a rate of 99 cents per net ton from Mantua, Ohio, to Geneva, Greenville, Orangeville, Pymatuning, Shenango and Transfer, Pennsylvania.

Docket 69877.—(Shipper's proposal). Dolomite, roasted, refractory dolomite, in granular form, treated or untreated, clinkered or burned to a dead state in carloads. Establish a rate of $2.80 per net ton from Narlo, Ohio, to Sterling, Illinois.

Docket 69926.—(Shipper's proposal). Agricultural limestone, unburned, in open-top cars in carloads. Establish from Woodville, Ohio, to Bellaire, Ohio $1.71, to Cambridge, Ohio $1.49, to Lore City and Quaker City, Ohio $1.60. All rates per net ton.

Docket 69927.—(Shipper's proposal). Stone, fluxing, furnace or foundry, melting or refractory, unburned, in bulk, in open-top cars in carloads. Minimum weight 90 per cent of the marked capacity of the car, except that, when cars are loaded to their full cubical or visible capacity, the actual weight will apply. Establish a rate of $1.34 per gross ton from Northwestern, Ohio, Group 1 origins to Economy, Pennsylvania.

General Rate Increase

Under Ex Parte 148 effective March 18 the rates on lime and lime products were increased 6 per cent. The rates on sand, gravel, broken rock, slag, and limestone were increased 3 per cent.

Originally the railway and water carriers had petitioned for a general increase of 10 per cent, however the commission prescribed a lower basis. The increases are approved for the period of the war and six months thereafter. The effective date, March 18, applies on interstate traffic. The effective date for the increases on intrastate traffic depends upon each state. At this writing Ohio intrastate increase became effective March 24, and Indiana intrastate March 21.

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OCCUPATIONAL DISEASES and the LAW

Exposure

Hodges v. Workmen's Compensation Commissioner et al., decided by the Supreme Court of Appeals of West Virginia, October 14, 1941, rehearing denied December 8, 1941; reported at 17 S.E. (2d) 450.

An award of compensation for silicosis was contested on the ground, among others, that the claim had not been made within one year from the date the employee was subjected to injurious exposure to silicon dioxide as required by Section 10 of the West Virginia statute. The employee was first employed as a rock driller, and as such was admittedly exposed to air containing a large percentage of silicon dioxide, and was later employed as a coal loader. The court, in this appeal, holds that the record in the case clearly shows that even as a coal loader the employee was exposed to a sufficient quantity to be injurious, so that the last injurious exposure of silicon dioxide, for purposes of the statute, was when his last employment as a coal loader ceased, rather than when he (later) ceased working as a rock driller.

The statute (West Virginia Code, Section 23-6-5) also makes it a condition for an award of compensation that an employee shall have been exposed to silicon dioxide dust for at least two years "in the same employment" in the state at the time he became disabled. The award in this case was contested on the ground that "in the same employment" means "by the same employer." The court, however, holds that the term means employment in the same sort of work, even for different employers. Under West Virginia decisions the employer is not relieved of common-law liability for an uncompensable injury "and since the last employer to negligently contribute to the injury is liable at common law, and since the statute relieves the last employer of that liability in silicosis cases by making the disease compensable, it follows that the last employer in having his rating affected by a compensable silicosis case is not being subjected to a greater burden than that which he would carry under his common law responsibility."

The employee in this case had been exposed to silicon dioxide in West Vir-

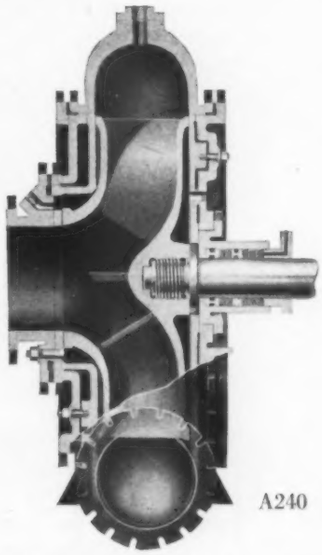
Amsco "COUNTERFLOW" *Pump* Produces Sand and Gravel for Arkabutla Dam

Arkabutla Dam, a government flood control project on the Coldwater River in Mississippi, will require approximately 4,158,000 cu. yds. of earthfill. The dam proper will be about 10,000 ft. long. A reservoir of 52 sq. miles will be provided.

Gravel and sand for the drainage mat at the base of the fill, and gravel for the spillway were supplied by Kochtitzky & Johnson, sand and gravel producers and dredging contractors of Avalon, Miss. Their dredge is equipped with a 16" Amsco "COUNTERFLOW" Pump, type "XH-CF", Form 44, right hand bottom discharge construction.

The "COUNTERFLOW" design effects the circulation of clear water under pressure, between the impeller shrouds and side plate liners, keeping out grit-laden water that would otherwise cause abrasive wear. This feature, together with free-flow impeller passages and the use of tough, impact and abrasion resistant 13% manganese steel for the impeller, shell, side plates and liners, assures a maximum service life with minimum maintenance.

Aggregates producers have long used Amsco Pumps successfully and today more than half of the dredge pumps in that work bear the Amsco trade-mark.

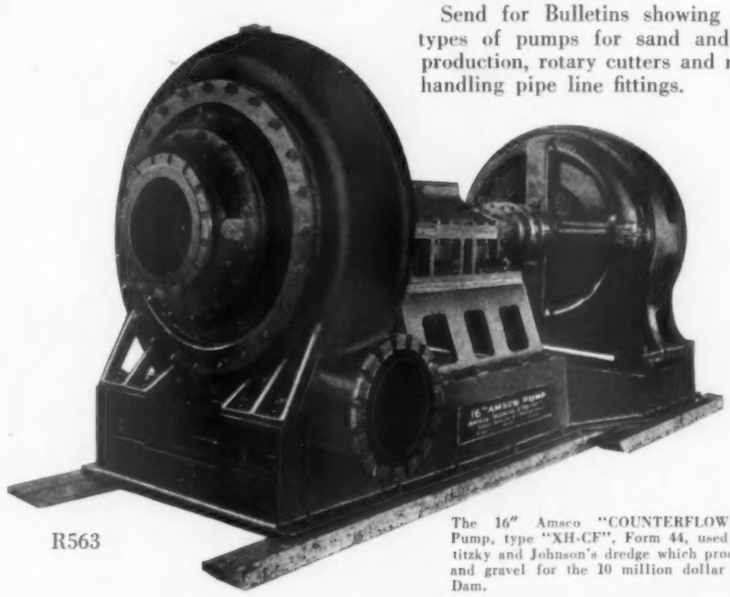


A240

"COUNTERFLOW" design details are shown on the section drawing above. Note clear water is forcibly circulated between the impeller shrouds and side plate liners. Wide passage, funnel-mouth impellers are used and are screwed onto the pump shafts for maximum security and ease of replacement.

The shock and abrasion resistant qualities of genuine manganese steel make it ideal for Rotary Cutters; and Dredge Pipe Line Fittings, such as elbows, pipe, nipples, reducers, expansion joints, hose nipples, and flap valves.

Send for Bulletins showing various types of pumps for sand and gravel production, rotary cutters and material handling pipe line fittings.



R563

The 16" Amsco "COUNTERFLOW" Dredge Pump, type "XH-CF", Form 44, used on Kochtitzky and Johnson's dredge which produced sand and gravel for the 10 million dollar Arkabutla Dam.

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ginia for more than two years. He had done so while engaged in a similar, if not identical, work. "In other words, he has contracted an occupational disease while continuously exposed to the same hazard in West Virginia for a period of two years, during which time his employer had been different corporations." The court is "of the opinion that those circumstances are sufficient to render silicosis compensable. The interpretation of the statute contended for by the company would place the compensability of silicosis more directly within the control of the employer. If necessary for the employment to continue for two years by the same employer, discharging the employee before the lapse of two years would defeat compensation and fully protect the employer's rating."

Insurer's Liability

Lanzetta v. Allied Decorating Co., Inc., et al., decided by the New York Court of Appeals, November 19, 1941; reported at 287 N.Y. (Mem.) 26.

This decision affirms, without opinion, an earlier decision of the Appellate Division of the New York Supreme Court (261 App. Div. 861), which held that in the case of a workman disabled by an occupational disease (dermatitis venenata) the award of compensation was properly made against the employer and the insurance carrier by whom the employer was insured at the time the employee's disability was incurred. It was contended (unsuccessfully) that the disability, if attributable to the employment, should be charged solely against the insurance carrier covering the employer at the time the disease was contracted, or, if this contention should not be upheld, that the disability should be apportioned between the carrier insuring the employer when the disease was contracted and the carrier covering the employer at the date of disablement.

Dust Disease

Hendler v. Cayton Bakery, Inc., et al., decided by the New York Supreme Court, Appellate Division, Third Department, November 26, 1941; reported at 31 N.Y.S. (2d) 299.

A baker, disabled by baker's asthma, or bronchitis, which he acquired in the course of his employment from the inhalation of flour dust, won an award of compensation for certain periods of total disability under Article 4-A of the New York Workmen's Compensation Law on the theory that his disability was caused by a dust disease within the meaning of that article. That award of the State Industrial Board is affirmed by a majority ruling of the Appellate Division in this appeal. Two justices, however, dissent on the ground that the particles of flour dust inhaled "are not insoluble in the body, or akin to that type of dust which merely acts mechanically as an abrasive irritant and causes silicosis and kindred diseases. To the contrary, the proof indicates that flour dust when inhaled breaks down into a fermentation process causing the formation of lactic acid which produces a chemical irritation in the lungs. The resultant disease is thus something more than a dust disease as such term is used in Article 4-A. It falls rather in the classification of an occupational disease as provided for in paragraph 28, Section 3, subdivision 2 of the act."

When "Contracted"

Kellerman v. City of St. Paul, decided by the Supreme Court of Minnesota, December 12, 1941; reported at 1 N.W. (2d) 378.

The Minnesota Workmen's Compensation Act provides that disability resulting from an occupational disease is not compensable unless the disease is contracted within the 12 months previous to the date of disablement and unless the disease is not contracted prior

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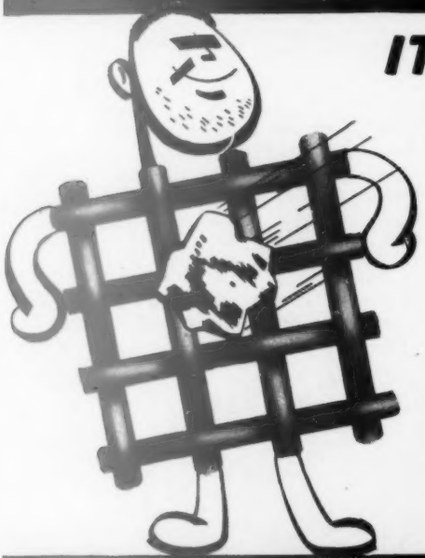

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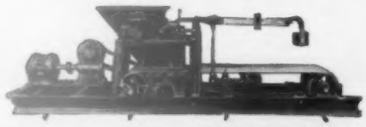

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to the effective date of the applicable statute, which in the case of an amendment making coronary sclerosis an occupational disease was April 21, 1939 (Mason's Minnesota Statutes, Section 4327 (3, 11). It is decided in this case that coronary sclerosis is "contracted" within the meaning of the statute when it first manifests itself so as to interfere with bodily functions, which in this case occurred only shortly before the workman's death, and an award of compensation is affirmed. It is further held that the 1939 amendment making coronary sclerosis compensable as an occupational disease does not violate various provisions of the Federal and state constitutions.

Medical Commission

Flanigan v. Reo Motors, Inc., decided by the Supreme Court of Michigan, January 6, 1942; reported at 1 N.W. (2d) 572.

In this case it was contended that Section 6 of Act No. 61, Michigan Public Acts of 1937, which provides for the appointment of a medical commission and makes its report final, is unconstitutional. The court rules, however, that an employer who has accepted the benefits of the Workmen's Compensation Act may not challenge the validity of the act or any amendment thereto.

The employee concerned was laid off because his arms, face, neck and legs were raw and sore from dermatitis venenata, an occupational disease, to the extent that fellow workmen complained against working with him. The Department of Labor and Industry and the court hold that under the circumstances, he is entitled to compensation for disability. The workman "should not be penalized for attempting to continue work when his condition was such that he might well have claimed he was physically unable. His power to earn a living was just as effectively cut off as if he had admitted he was completely unable to continue work."

• To Save Rubber

The B. F. Goodrich Company, Akron, Ohio, has just published the first four of a series of six vest-pocket size pamphlets on "How to Get the Most Service Out of Industrial Rubber Products." The series is designed to assist in the tremendous program of rubber conservation now made necessary by war developments.

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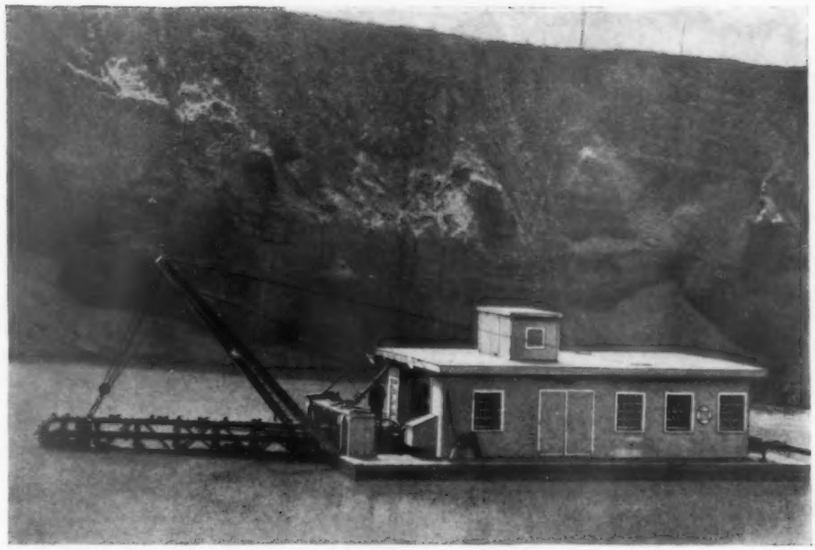

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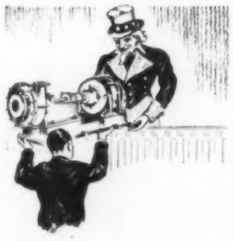
This story of Morris Dredges . . . the dredges that will not be baffled . . . has been repeated again and again, all over the country. It is the natural result of the long and extensive experience of the Morris engineers in solving difficult hydraulic dredge and centrifugal pump problems.



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LABOR DECISIONS

Interstate Commerce

Pedersen v. J. F. Fitzgerald Construction Co., decided by the New York Supreme Court, Appellate Division, Third Department, November 12, 1941; reported at 262 App. Div. 665.

A former employee of a contractor sued on behalf of himself and certain other former employees to recover overtime wages and other benefits under the Fair Labor Standards Act of 1938. The work on which they were employed was the construction and repair of railroad abutments and substructures. The court holds that "while the railroad company was obviously engaged in interstate commerce, the defendant was an independent contractor employed by the railroad to perform work clearly local in its character and separate and distinct from such commerce, "so that the Fair Labor Standards Act does not apply."

Negotiations

North Electric Mfg. Co. v. National Labor Relations Board, decided by the U. S. Circuit Court of Appeals, Sixth Circuit, November 12, 1941; reported at 123 Fed. (2d) 887.

A cease-and-desist order of the National Labor Relations Board was based in part upon the board's conclusion that it was unlawful for the employer to question a union's jurisdiction over the employees in its plant, and that the employer "intended by the presence of observers and the installation of loud speakers to insure widespread knowledge among the employees of its position, and thus created in the minds of employees doubt and uncertainty as to the utility of their joining the union or designating it as their representative, and that this discouraged membership in and designation of the union as collective bargaining representative."

The court holds that the conclusion that these acts were unlawful is not justified by the terms of the National Labor Relations Act, and the portion of the order based on that conclusion is annulled. It is not a violation of the act, says the court, "for the management to desire reasonable proof of majority unionization and an authentic selection of a bargaining agent. On the contrary, the refusal of an employer to recognize the union as representative of the employees without an election is not an unfair labor practice." Furthermore, the presence of employees at conferences between the union and the employer, and the opportunity afforded all workmen (by loud speakers) to secure

accurate, first-hand information as to what happened at the first meeting "was not only a natural, but a legitimate method of attempting to secure an answer to the questions (1) whether the employees were actually represented, or (2) desired to be represented by this particular union."

Coöperative

Fleming, Administrator, v. Palmer, et al., decided by the U. S. Circuit Court of Appeals, First Circuit, November 18, 1941; reported at 123 Fed. (2d) 749.

A business formerly operated by a corporation was succeeded, after the passage of the Fair Labor Standards Act of 1938, by a coöperative formed by former employees of the corporation. The coöperative used the same buildings and equipment as the old company. It was financed by the same source, employed the same operating method and had largely the same personnel doing the same work. The earnings of the workers remained practically the same. In this suit, which was brought to enjoin the coöperative and certain individuals from violating the Fair Labor Standards Act, the defendants contended that the coöperative is a "labor organization" exempt from the act under Section 3(d), or at least that the defendants are not "employers" and the members of the coöperative not "employees." The Federal district court upheld the contention that there was no employer-employee relationship. In this appeal, however, it is held that under the facts shown by the evidence the coöperative is controlled by the individuals who previously owned and controlled the corporation, and that the "simple, economic fact" is that the members are working for those individuals and hence are employees of them and of the coöperative within the meaning of the act. The Court of Appeals therefore holds that (since violations of the act, if it applied, were admitted) an injunction should be issued restraining the individuals and the coöperative from violating the act.

Employment

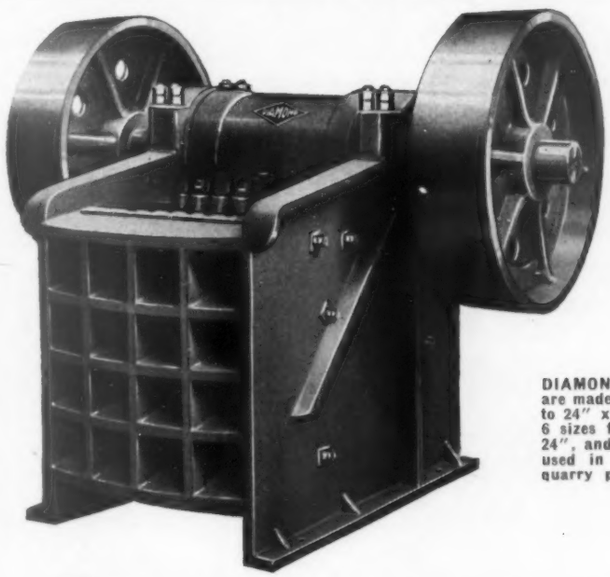
Maddox v. Jones, et al., decided by the U. S. District Court, Northern District of Alabama, Western Division, November 19, 1941; reported at 42 Fed. Supp. 35.

The defendants in this case are a corporation producing paper and wood pulp, and an individual engaged in the business of furnishing pulp wood to the corporation. The plaintiff is one of 50 workmen employed by the individual defendant to cut and handle pulp wood, and the suit was brought to recover unpaid minimum wages and overtime compensation and additional benefits under the Fair Labor Standards Act of 1938, on the theory that the individual defendant was acting for the corporation in hiring the workmen concerned.

The court rules that "in determining the word 'employ' to mean 'to suffer or permit to work,' undoubtedly Congress was trying to hold every manufacturer or industry engaged in interstate commerce responsible for connivance or collusion with anyone who assumed the status of an independent contractor to furnish raw material when in fact he was merely the agent or servant or employee of the manufacturer. In other words, the purpose of the act was to protect the employee against anyone whose real status in bringing about a contractual relationship is not *bona fide*. The complaint here contains no suggestion of collusion between the defendants, and this court can not read such into its language. It is impossible to read into it a claim that the paper corporation, through its officers or duly authorized agents for such a purpose, entered into a contract with the plaintiff whereby it became obligated to pay for his services."

Under such circumstances, the complaint did not aver facts sufficient to invoke the remedies of the Fair Labor Standards Act, and the complaint was dismissed.

When You Buy a Crusher What Should You REALLY Buy?



DIAMOND Standard Jaw Crushers are made in 13 sizes from 6" x 12" to 24" x 36" and Roll Crushers in 6 sizes from 16" x 16" to 54" x 24", and various sizes of these are used in stationary or portable quarry plants and crushing units.

THESE are the things you should look for and expect in the crusher you buy:

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5. Construction primarily based on the hardest type of crushing.

Don't buy on claims unless those claims can be thoroughly backed by performance records. And speaking of records, DIAMOND has some recent and very outstanding ones we're anxious to talk about. Either we, or any of our dealers will tell you all about it. In fact, we'd like to consult with you on *any* crushing, screening, conveying or elevating problem you have.

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Agreement

National Labor Relations Board v. Whittier Mills Co., et al., decided by the U. S. Circuit Court of Appeals, Fifth Circuit, November 22, 1941; reported at 123 Fed. (2d) 725.

It was contended that the employer involved here had disobeyed a decree requiring it to bargain collectively with a union representing its employees. The court finds, however, that "the bargaining went on the rocks because each bargainer was endeavoring to get into the agreement the things he wanted, and the union representatives lost patience." "The law," says the court, "requires good-faith bargaining. It does not require any particular form of agreement to be reached," and it is not the court's duty to determine which of the proposals would have been best for employer and employee. It is sufficient "to determine that respondents have not, in contempt of this court's order, failed and refused to bargain." A contempt order, accordingly, is denied.

An institutional advertising campaign asking for assistance from other companies sounds a new note in current advertising of large corporations. Keyed to the times when coöperation among producers of ordnance materials is vitally necessary for winning the war, Hercules Powder Company's "Toward V-Day" series asks what other companies have to sell, what suggestions they have which will help Hercules to do its part in the war effort.

The "V-Day" series asks executives of other companies to come to Hercules with suggestions for their products which Hercules might use in helping to win the war and in solving problems which will arise later.

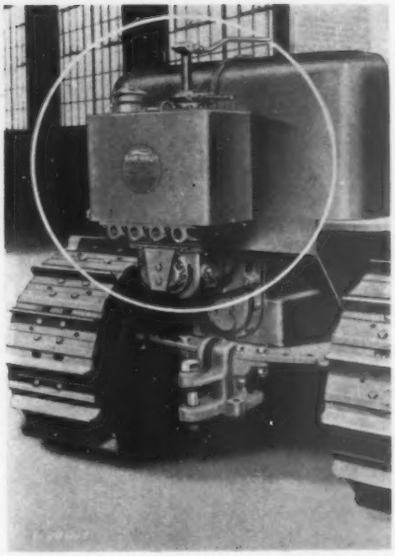
NEW MACHINERY and SUPPLIES

• Control Unit

The road-machinery division of Gar Wood Industries, Inc., Detroit, has announced the production of a new type of hydraulic-control unit for operating heavy-duty, material-moving machinery drawn by industrial track-type tractors, according to J. B. Haile, manager of the division.

"The Gar Wood hydraulic control unit converts mechanical power from the tractor motor to flexible hydraulic power for transmission to the hydraulic jacks on earth-moving scrapers, road-builders, bulldozers and rippers," Mr. Haile states. "The power for the unit is taken from the tractor motor through a direct shaft connection to the pump, either from the transmission shaft of the tractor in the rear or from the motor crankshaft in front. Before introduction for actual, everyday service, the unit was tested and tried for several years in various field operations.

"Simplicity in design is a feature of the new unit. The integral construction eliminates pipes, fittings and loss of oil. Working parts in pump and valve are made from high-grade alloy steel. Parts subject to wear are hardened and ground, assuring long life and maximum



Hydraulic-control unit (in circle) mounted on tractor.

resistance to wear. The large oil tank provides a greater oil supply and prevents oil from overheating. Ample oil passages throughout the valve, pump and lines reduce oil-flow resistance to a minimum, resulting in cooler operation and high efficiency. Two magnets are placed in the suction line of the pump to catch and hold any metallic particles that accidentally enter the oil supply."

• Drifter Drill

The D-505 drifter is the latest addition to the Ingersoll-Rand family of rock drills. It incorporates many new and improved features, and is said to be the fastest and most durable drifter ever produced by the company.

Exhaustive tests have shown that the efficiency of the D-505, based on inches drilled per cubic foot of air at 90 pounds pressure, is 34 per cent. greater than that of our previous 4-inch bore machines, and 52 per cent. greater at 70 pounds pressure.

Certain outstanding features contribute particularly to the ruggedness of the D-505. For example, the wall section of the front-head is 10 per cent. thicker than that of the previous 4-inch drifters. The shank aligner is 18 per cent. longer and 8 per cent. thicker, and an improved chuck design of heavier construction has been included. The design of the piston-stem cushion bearing allows a heavier metal section in the cylinder and furnishes better support. There is a port on each side of the cylinder, a feature which balances the piston within the cylinder.

The air to the front end of the cylinder passes directly between the ratchet and the head of the rifle bar. It is unrestricted by small ports. This assures good hole-cleaning, and aids in supplying constant lubrication to all moving parts.

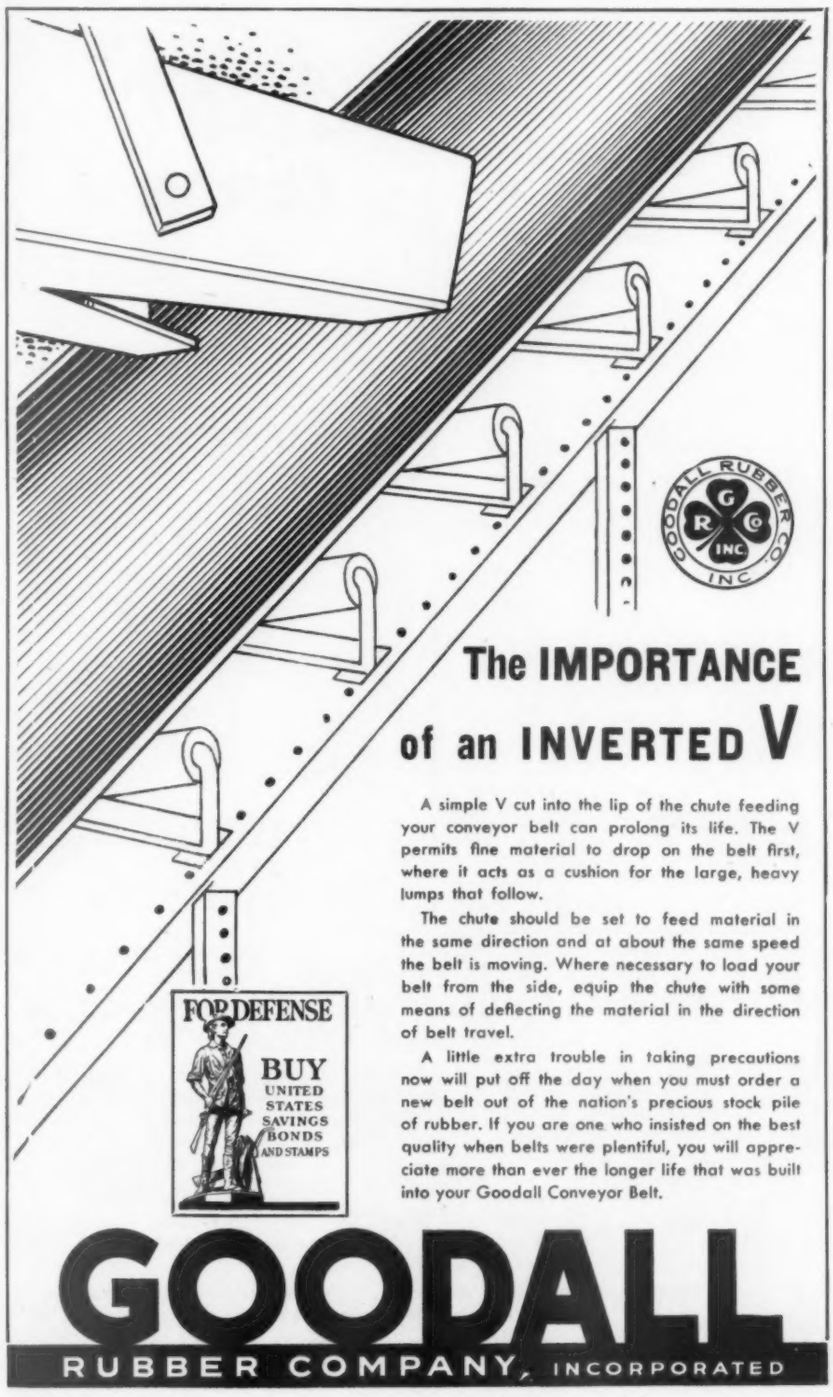
The D-505 employs a sturdy rifle bar which makes possible strong rotation. The rifle bar pawls are reversible for longer life. Operators will find that the throttle handle is more readily accessible, and that it is well protected by the back-head so that it cannot be broken easily.

Extra-rugged model drifter drill.

• Idler

Engineers of the Industrial Division, Continental Gin Company, Birmingham, have developed a new streamlined belt-conveyor idler that is considered an outstanding improvement.

All CGC idlers, regardless of type, have several improved features common to all. Idler rolls of all types are easily removed from supporting brackets by simply lifting them out. This can be done with conveyor in operation. All rolls are made in 4, 5, and 6-inch diam-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A simple V cut into the lip of the chute feeding your conveyor belt can prolong its life. The V permits fine material to drop on the belt first, where it acts as a cushion for the large, heavy lumps that follow.
The chute should be set to feed material in the same direction and at about the same speed the belt is moving. Where necessary to load your belt from the side, equip the chute with some means of deflecting the material in the direction of belt travel.
A little extra trouble in taking precautions now will put off the day when you must order a new belt out of the nation's precious stock pile of rubber. If you are one who insisted on the best quality when belts were plentiful, you will appreciate more than ever the longer life that was built into your Goodall Conveyor Belt.
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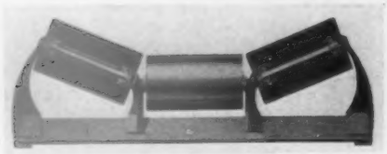

Cut-away view of idler.

eters of either cast iron or steel, to suit conditions, and are equipped with antifriction bearings.

Grease seals are of the all-metal labyrinth type, having five passes with the inner members protected from damage by a malleable-iron nut. This nut serves three purposes:

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(2) Sloping surfaces shed dirt or material being conveyed, preventing it entering bearings.

(3) Recessed groove in nuts fits down over sloping brackets, giving a fine support to rolls as well as tying brackets together.

The supporting brackets are made of high-grade malleable iron and are amply ribbed for strength with the upper ends of the brackets made in the form of an inverted V to shed dirt. Brackets are jig welded to an inverted angle base (standard construction) or to channel bases as may be desired. This construction gives a one-piece unit in a simple rigid design.

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Trade Literature

Baughman Lime Spreaders . . . the 9-to-1 Favorite in 1941. 4 pages. Baughman Manufacturing Company, Jerseyville, Illinois.

Low Temperature Welding with Castolin Eutetic Alloys and Fluxes. 32 pages. Eutetic Welding Alloys, Inc., New York City.

Lubriplate Lubricant 130-A Proves Outstanding on Production of War Materials. 4 pages. Fiske Brothers Refining Company, Newark, New Jersey.

Kennedy Crusher Facts. (Bulletin 800.) 16 pages. Kennedy-Van Saun Manufacturing & Engineering Corporation, New York City.

Thrustfre Centrifugal Pumps. (Bulletin 238.) 20 pages. Pennsylvania Pump & Compressor Company, Easton, Pennsylvania.

Worthington Type VS Air Compressors. (Bulletin H-621-B8.) 6 pages. Worthington Pump & Machinery Corporation, Harrison, New Jersey.

Vari-Pitch Speed Changers. (Bulletin B6013A.) 20 pages. *Ripl-Flo Vibrating Screens.* (Bulletin B6151A.) 16 pages. Allis-Chalmers Manufacturing Company, Milwaukee.

Marmon-Herrington All-Wheel Drive Trucks. 16 pages. Marmon-Herrington Company, Indianapolis.

Facts About Speed Prime Pumps. (Bulletin 400.) 22 pages. Chain Belt Company, Milwaukee.

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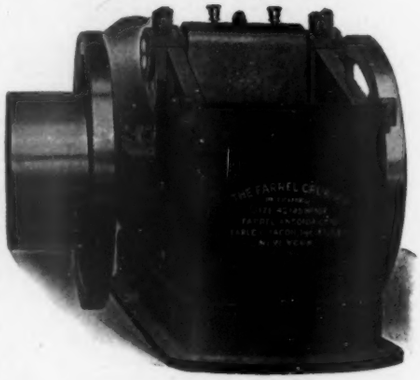

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NEW HOLLAND, PENNSYLVANIA

April, 1942

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Model C—*with Power Tamper and Feeder, Hand Strip, Strike-off and Off-Bearer.*

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Stearns alternate-drop 8-bar tamping action insures uniform, dense block. Feeding and tamping adjustable to aggregate and product.

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The CONCRETE MANUFACTURER

April, 1942

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Purdue Sponsors 1942 Concrete Short Course

More than 100 ready-mixed-concrete operators and engineers from Indiana, Iowa, Kentucky, Ohio, Wisconsin and Michigan, assembled at Purdue University, Lafayette, Indiana in February for the third annual two-day short course on ready-mixed concrete. F. R. McComb, Portland Cement Association, Indianapolis, spoke on *Aggregate Characteristics of Concrete* and Ralph Simpson, also of Indianapolis, discussed *Types of Portland Cement.*

V. P. Ahearn, Washington, D. C., executive secretary of the National Ready-Mixed Concrete Association, was one of the main speakers, having as his topic *The Position of Ready-Mixed Concrete in War Efforts.* Two other speakers were F. M. Welch, and W. W. Hadley, Indianapolis, the latter bridge engineer for the Indiana state highway commission.

Dr. Louis M. Sears, of the university history department, was the speaker at a dinner. The second day was largely devoted to demonstrations and laboratory tests. Prof. Ray B. Crepps, of the Purdue school of civil engineering, was in charge of the course, which is offered by the civil-engineering school in conjunction with its extension department and the Wabash Valley Ready Mixed Concrete Association.

Supplies Ready-Mix for Store Building

The D. J. Kennedy Company, Pittsburgh, supplied 15,000 cubic yards of concrete for Sears, Roebuck & Company's new three-story, all-concrete store now under construction and one of the largest retail stores of its kind in the United States.

New Plant to Make Concrete Planking

The Martin Fireproofing Corporation, operating a plant in North Tonawanda, New York, for the production of a special type of lightweight reinforced-concrete plank for roofs and flooring, will double its output with the opening of a new factory in Albany within a few weeks, President Charles A. Martin has announced.

"The Albany plant with approximately 10,000 square feet of floor space will cost about $40,000," said Mr. Martin. "Output of the North Tonawanda plant is approximately 11,000 square feet of the planks daily and the Albany plant will have the same capacity."

Application has been made by Mr. Martin for a patent on the new slabs which measure 9 feet long, 16 inches wide and 2 inches thick. The slabs are reinforced with electrically-welded galvanized-steel mesh and are tongued and grooved to allow the slabs to fit into each other.

"These slabs are used as roofing on such plants as the Buffalo Arms Corporation and the new Watervliet Arsenal," said Mr. Martin.

Concrete Brick Used in London Shelters

Dunbrik Limited of London is selling large numbers of concrete bricks for air-raid shelters, according to Stanley Robinson, general manager of Dunbrik Limited.

The bricks are supplied in several different colors and at 60 shillings per thousand, equivalent to approximately $15.00 in our money. The machinery and complete equipment for these brick-manufacturing plants were furnished by the W. E. Dunn Manufacturing Company, Holland, Michigan.

Kansas City Firms Get Ordnance Job

A joint contract for mixing and delivering 100,000 cubic yards of concrete in the construction of a powder plant at Newport, Indiana, has been awarded to the C. A. Brockett Cement Company and the Kansas City Quarries Company, both of Kansas City. Deliveries to the plant, which will be known as the Wabash River Ordnance Works have already begun. The contract is with E. I. du Pont de Nemours & Company.

The two Kansas City firms erected their own mixing plant on the site, with arrangements for heating the concrete in cold weather. An estimated 4,000 carloads of materials will be required, and the mixing plant is said to have a capacity of 600 cubic yards of concrete every eight hours. Construction is expected to require about one year.

The same firms supplied the concrete for the Lake City Ordnance Plant.

J. K. Davidson & Brother of Pittsburgh are supplying 15,000 cubic yards of concrete for the $4,000,000 plant of the Union Carbide & Carbon Company at Kittanning, Pennsylvania.

The plant of the Standard Concrete Pipe Company at Springfield, Illinois, as seen from the storage yard.

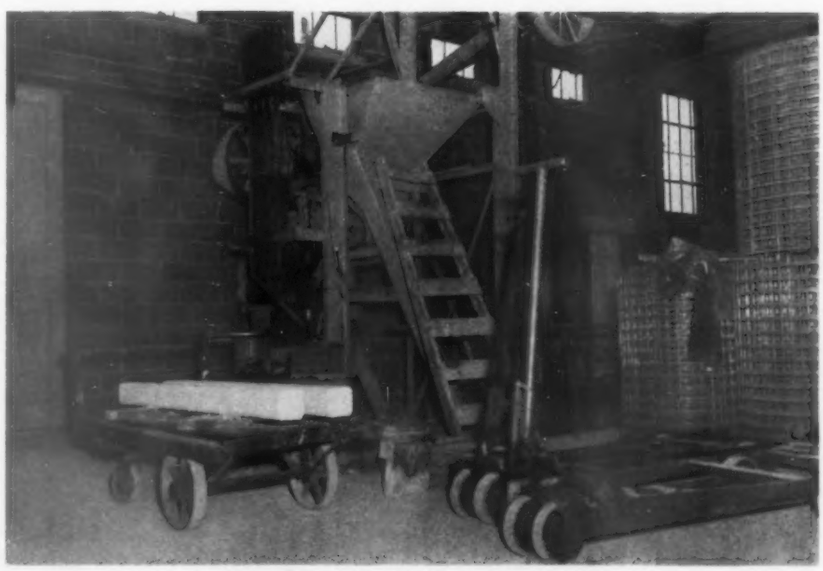
New Illinois Pipe Plant Built 100% of Concrete

ONE of the strongest selling arguments in favor of concrete masonry and concrete generally is its resistance to fire. And, since fireproof construction carries an extremely low insurance rating, the savings which result over a few years quickly pay for any increased first cost of the building through the use of noncombustible materials.

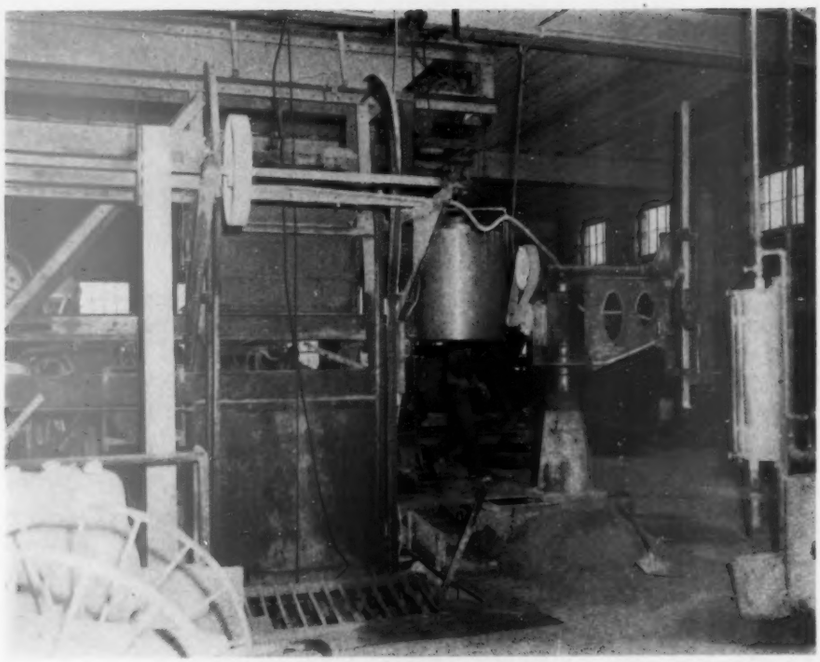
When W. S. Gearhart formed the Standard Concrete Pipe Company in 1931 at Springfield, Illinois, he installed his equipment in a tin-clad frame building not unlike many one sees used for that purpose. To protect his investment, however, he was forced to buy insurance at the high rate of $4.79 per $100. His new plant, the realization of a dream that began to take shape several years ago, is absolutely fireproof. Now he pays for insurance against all hazards at the rate of only 6.3 cents per $100 or less than 1½ per cent. of his former rate! The new plant structure is one of the finest of its type in the country and when one considers that the investment probably totals $75,000, this enormous saving in fixed charges has a tremendous influence in keeping overhead costs down.

By HARRY F. UTLEY

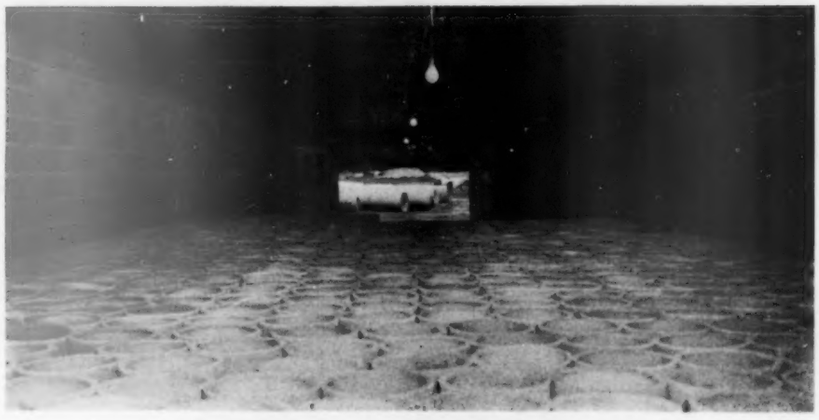
Compacting the concrete in a pipe form. A square steel rod turned by an electric drill is used for this purpose.



Block machine and two lift-trucks. Two right-of-way markers made at the plant are on truck at left.



Pipe machine on which are made all the small-diameter pipes.



One of the six 20- by 80-foot curing rooms.

Roller and welder for forming and fastening the reinforcing cages.

The plant, built in 1940, is of cinder-block construction. The roof is of Flexi-core reinforced-concrete slabs supported by 12- by 18-inch steel I-beams and concrete pillars. These pillars are unusual, since they are made of concrete pipes filled with concrete and each is reinforced vertically with four 1-inch steel rods. The boiler-room flue, too, is made of 30-inch concrete pipe and is lined with firebrick above the roof line. The plant proper is 80 by 125 feet in area and the six curing rooms occupy a similar space, each being 20 feet wide and 80 feet long. The entire plant is floored with concrete, with concrete runways criss-crossing the yard. The plant and storage yard occupy a 13-

Aggregates elevator and four distributing spouts.

acre tract in Springfield's southside industrial district.

Aggregates are handled by a short belt-conveyor and an inclosed Columbus bucket-elevator which rises to a height of 61 feet and distributes the materials through four spouts to compartments in a 16½- by 22-foot concrete-stave silo or a hopper-bottom bin of 65-ton capacity.

All sizes of plain and reinforced-concrete pipes are produced up to 60 inches in diameter. All the large-diameter sections are poured inside the building and are steam-cured, a practice which should be universally adopted but is rarely used in large-size pipe manufacture. Machine-made sections in 3- and 4-foot lengths are made on a Phil Easterday machine served by an 18-cubic foot Besser mixer and a skip-hoist designed by Mr. Gearhart. The 48-inch and larger size pipes are poured in Quinn forms and pallets. Jaeger 1- and 2-bag tilting-drum mixers prepare the concrete for the poured pipes and this is distributed to the forms by pneumatic-tired buggies. The concrete is compacted by inserting a tool consisting of a long square steel rod fitted to an electric drill, as one of the

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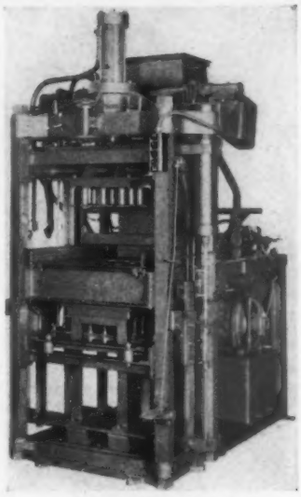

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accompanying illustrations shows. A gantry crane handles the pipes and forms. Reinforcing cages are formed on a Hendley & Whittemore roller and fastened with a Sherman spot-welder.

The blocks are molded on an Anchor power tamper, a new Besser 18-cubic foot mixer having just been installed to supply the machine. About 100 units per hour can be manufactured with two men working. Two Lift Trucks, Inc. units move the racks in and out of the curing rooms.

Flexicore floor and roof slabs are also produced, as well as a variety of specialty items including right-of-way markers for the Illinois Highway Department and battery boxes and signal foundations for several railroads.

A stoker-fed George Otto water-tube boiler supplies steam for heating and curing. Modine unit-type forced-air heaters blow the heat into the curing rooms. Steam jets release moisture just ahead of these blowers and the forced air helps to move the fog into the far corners of the rooms.

A 21- by 40-foot room now used as an office will eventually house a machine shop, and a separate office building will be erected. A sanitary shower- and change-room is provided for the employees. All deliveries are made by hired trucks or by railroad, two lines, the Chicago & Alton and the Illinois Terminal, serving the plant.

Mr. Gearhart is well-known throughout his shipping area, especially among road builders, since he served his state

President W. S. Gearhart at his desk.

as chief highway engineer from 1909 until 1919. Afterward he opened a quarry and plant at West York, Illinois to produce commercial crushed stone and agricultural limestone. This plant, operated as the Illinois Limestone Company, is still producing at the rate of about 40,000 tons annually. In 1922 Mr. Gearhart also entered the contracting business and continued in the construction industry until he disposed of his equipment to enter the concrete-products field a decade ago.

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Commercial Cored Pallets can be dropped, walked on, stored in wet places, stored in dry places, and nothing happens.

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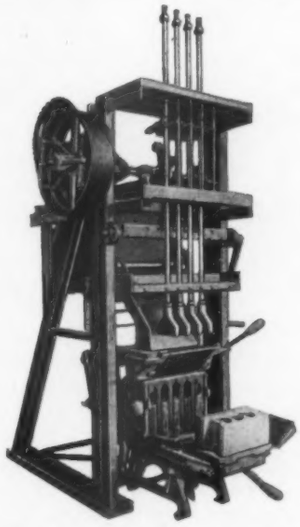
THE COMMERCIAL SHEARING AND STAMPING CO.
YOUNGSTOWN, OHIO



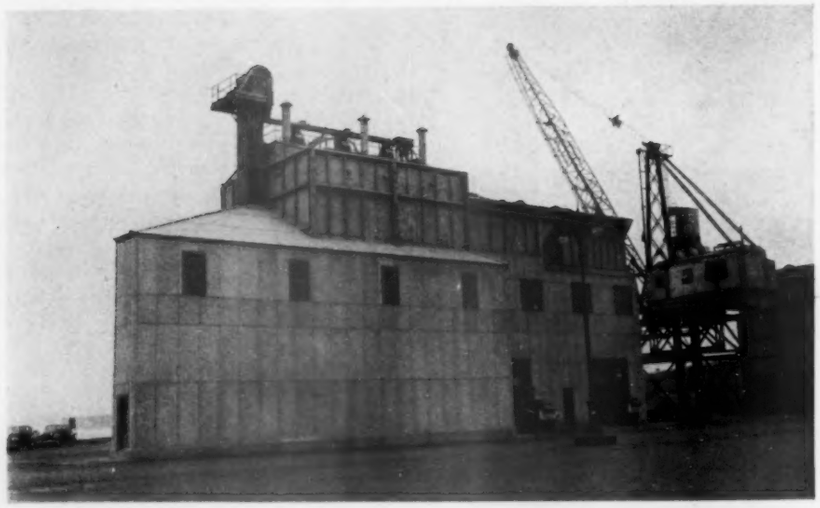
Recognized Everywhere

The Hobbs Jr. Face-Down Block Machine is recognized everywhere as the great general purpose machine of the concrete-products industry. Famous for its wide range of sizes and the variety of blocks it can produce. As illustrated, it is equipped with striking and finishing device, shown under the floor-type tamper and with power feeder.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers and Joltcrete, Stearns mixers, and Cast Iron and Press Steel pallets, Straublox oscillating attachments, etc. Repair parts for: Anchor, Ideal, Universal, Stearns, Blystone mixers and many others.

ANCHOR CONCRETE MACHINERY CO.
G. M. Friel, Manager Columbus, Ohio

RIGHT—This view of the New York plant shows the dual truck-loading arrangement and the 3-cubic yard "whirley."



Operation of McCormack Transit-Mix Fleet Is Far Flung, Broad in Scope

THE McCormack Transit-Mix Concrete Company, Inc., of New York City, formerly known as the Transit Mix Concrete Company, Inc., has for many years been one of the leading commercial producers of ready-mixed concrete. When the huge program of rearmament and defense construction began to take form, this company immediately applied its invaluable experience acquired over a period of many years to the production of concrete for these purposes. In January 1941 an affiliate, the U. S. Transit Mix Concrete Corporation, began the production of 300,000 cubic yards of concrete for the Elwood and Kankakee ordnance and explosives plants near Joliet, Illinois. This project, described in the June 1941 issue of PIT AND QUARRY, has since been completed. The concrete was supplied from a single large central-batching plant. Earlier this company had supplied all the concrete for two large steel mills in the East and other projects from similar temporary plants.

The company has nearly completed the production of over 400,000 cubic yards of concrete for the Delaware Aqueduct from a large central-batching plant located near Shaft 18, 4 miles north of White Plains, New York. This concrete is being supplied to Associated Contractors, Inc., a combination of the Kaiser and Walsh interests, for tunnel and shaft linings, effluent chambers, an aërator, etc. The pouring of the tunnel lining was begun on March 1, 1940 and was completed a year later. Except for miscellaneous small pours, the project was expected to be completed in March of this year. This plant, known as the Valhalla, has a batching capacity of over 250 cubic yards per hour but its full capacity has seldom been required for more than a few hours consecutively. On 24-hour, 3-shift operation the "peak" output has been 3,300 cubic yards.

The sand and gravel used in this concrete are received in barges at a dock at Port Chester on the Byram River. A Lima 600 crane, with a Cummins

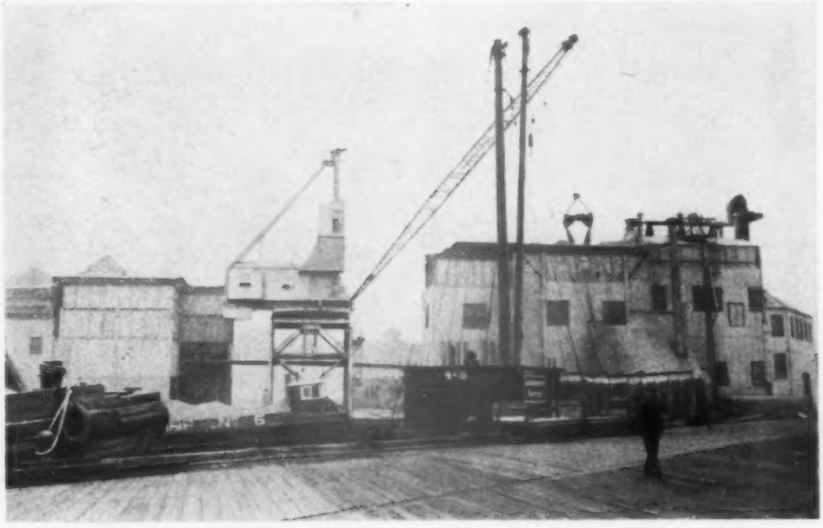
By W. E. TRAUFFER

A loaded 5-cubic yard truck-mixer coming out of the Valhalla plant with concrete for the aqueduct.

This view of the Valhalla plant shows the aggregate-handling crane and conveyor at left and the cement bins and elevator.

Diesel engine and a 2½-cubic yard clam-shell bucket, unloads these materials and places them either in truck-loading bins or on stock-piles with a capacity of 50,000 cubic yards.

The hauling to the plant is done by a fleet of eight Mack trucks with Cummins Diesel engines and 16-cubic yard dump bodies. The 23-mile round trip is made in an hour.



This view of the New York plant shows a barge-load of cement containers. The aggregate bins at left are separate from the main plant.

At the concrete plant the trucks dump their contents into three underground hoppers of 150-cubic yard individual capacity, one each for sand and ¾-inch and 1½-inch gravel. A 30-inch by 100-foot tunnel belt-conveyor feeds a 250-foot inclined belt-conveyor from which these materials are discharged into the four 100-cubic yard compartments of the Blaw-Knox steel plant bin.

Stock-piles of aggregates are maintained near the plant. These materials are moved by a Thew Lorain 70 crane with a 1-cubic yard clam-shell bucket.

The bulk cement used is received in special cars at a cement depot in North White Plains. There it is unloaded into a track hopper from which a screw-conveyor and bucket-elevator transfer it to a 3,500-barrel C. S. Johnson cylindrical bin. From this bin the cement is removed to two special trucks, each with a capacity of 100 barrels, in bodies having covers which, when removed, make them usable as 20-cubic yard aggregate-delivery trucks. They haul the cement two miles to the plant, where it is discharged into a hopper. A screw-conveyor and elevator feed the cement to either the 3,500-barrel plant bin or an 1,800-barrel auxiliary bin from which it can be fed back to the elevator.

The cement is withdrawn through two 20-inch by 40-foot screw-conveyors to a 6,000-pound Blaw-Knox weigh-batcher equipped with a Kron dial scale. The conveyor motors are push-button controlled and are automatically stopped when the desired weight is reached. The contractor has a recording meter connected to this scale for checking the amount of cement going through this plant.

The aggregates are discharged through manually-operated gates into a 6-cubic yard Blaw-Knox weigh-batcher equipped with a 3-beam scale.

The number of truck-mixers used in any one day has varied from 3 to 19, but most of the time at least 9 have been in use. They are drawn as needed from the large fleet of mixers operated by the company in the New York metropolitan area. All are Jaeger 5-cubic yard mixers mounted on special Mack chassis powered by Cummins Diesel engines. For much of the work now going on the concrete has been discharged from the truck-mixers into concrete buckets which are moved into pouring positions by a crane.

Another view of a barge-load of the bulk-cement containers at the dock.

Since the company started operation of its first commercial plant in June, 1927 the ready-mixed-concrete industry has experienced a phenomenal growth and there have been many changes in methods and equipment. This rapid development is evident from the facts that none of the plants operated by the company in 1929 are now used and that the last of the old-style transit-mixers then employed was retired from service on January 1, 1940.

Late in 1929 the writer spent several days visiting the company's operations and an article describing them was published in the January 15, 1930 issue of PIT AND QUARRY. At that time the company operated three identical dry-batching plants at Franklin Street and the North River, at 29th Street and South River, and at 54th Street and the North River in Manhattan in addition to the original plant at 70th Street and the East River. It had another plant at 165th Street and the Bronx River in the Bronx and similar batching plants were later built in Brooklyn and in Astoria, Long Island. The original plant served as a model for the later ones. The delivery fleet at that time consisted of 50 transit-mixers of which 37 had 5-cubic yard bodies. All the mixers were mounted on Mack trucks.

One of the 55-barrel capacity bulk-cement containers with air and discharge hoses.

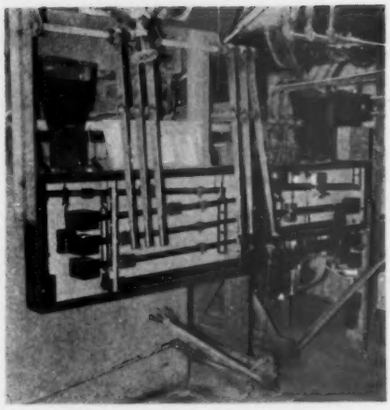
In Manhattan the company now operates only one plant instead of four. From this plant, located at 21st Street and the East River, deliveries are made to all parts of that borough. A batching plant is located in the Bronx at 165th Street and Whitlock Avenue on the Bronx River and another is in Flushing, Long Island at Janet Place and Roosevelt Avenue on Flushing Creek.

The company's fleet now consists of 86 truck-mixers: 11 Jaeger 5-cubic yard mixers on Mack chassis with 4-cylinder Cummins Diesel engines, 57 Jaeger 5-

cubic yard mixers on Mack chassis with 6-cylinder Cummins Diesel engines, and 18 Chain Belt Rex Moto-Mixers mounted on Model FJ Mack trucks with 6-cylinder Cummins Diesel engines.

The East River plant was built two years ago and is one of the largest and best batching plants in the industry. It is a 2-unit plant with separate aggregate bins and cement feed-screws for each batcher. Each unit can load truck-mixers at the rate of about 250 cubic yards per hour. Some of the noteworthy features of this plant are the economical operation made possible by the small amount of rehandling of materials and the automatic controls, which make it possible for a small crew to operate the plant. Space limitations, due to the location of the plant between the East River and the recently completed East River Drive, made compactness essential and held aggregate-storage space to 3 days' supply. The plant was designed by the company's staff in coöperation with the Blaw-Knox Company and was built entirely by its forces. It is constructed of steel and concrete and all the buildings have Johns-Manville Transite roofing and siding.

Motor-reducer drives of the feed-screws to the two cement-weighing batchers in New York plant.



Aggregate-weighing batcher with cement batcher and feed-screw at right in New York plant.

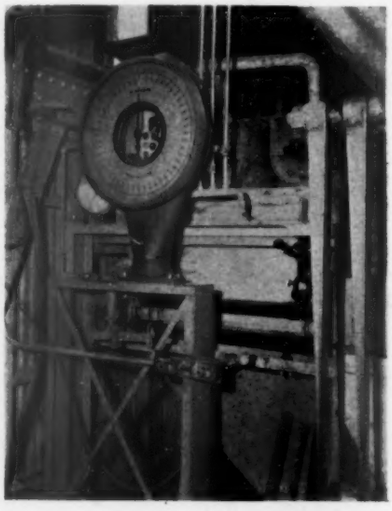
The cement and aggregates are received in barges and the plant dock has space for two cement barges and from 8 to 10 aggregate barges. One cement barge and four 600- to 800-cubic yard aggregate barges can be unloaded at one time.

A Lambert whirley, mounted on a steel-and-concrete foundation, unloads aggregates from the barges into the two plant-storage bins, one of which can store 300 tons in four compartments, and the other 450 tons in six compartments. The whirley has a 112-foot boom and a 3-cubic yard Blaw-Knox clam-shell bucket. It is powered by two Cummins Diesel engines so arranged that either engine can be used alone if necessary. These motors can revolve the whirley at the rate of 3½ r.p.m. The maximum line speed is 350 f.p.m. Usually two sizes of crushed stone, three sizes of gravel, two grades of sand, and grits are stored.

The whirley also transfers aggregates from barges to six Blaw-Knox steel bins separate from this plant. One 3-compartment, 200-ton bin has a 1-cubic yard Blaw-Knox batcher for loading batched aggregates into trucks. The five 225-ton single-compartment bins are used for loading aggregates into dump trucks.

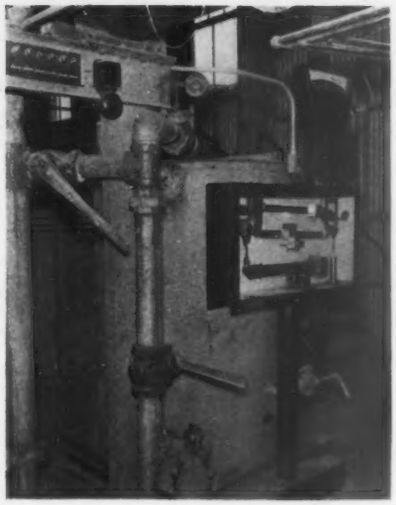
The bulk cement used in this plant is received in 55-barrel-capacity air-activated L.C.L. containers of which 20 are usually carried on a barge. To unload a container a 2-inch compressed-air hose is attached to it and the cement is blown own through a 4-inch hose which is connected to the cement line leading to the plant bins. A Chicago Pneumatic 450-c.f.m. compressor supplies the air for unloading the cement and for jets in the bins. One man operates the entire system which unloads a tank in from 10 to 14 minutes. A barge-load of 1,058 barrels has been unloaded in 5 hours.

The cement is discharged through a Kennedy-Van Saun 6-way valve into any of the six cement-storage bins which are arranged in an unusual manner. The three main storage bins hold 2,000 barrels, 1,000 barrels and 2,000 barrels respectively and have V-bottoms extending almost to the ground. A 14-inch-diameter screw-conveyor feeds the cement from these bins to a special double-chain bucket-elevator with 1-cubic foot buckets. A 16-inch screw-conveyor distributes the cement to any of these bins or the three service bins through three dual butterfly valves. This elevator-and-conveyor system can be used in an emergency to feed bulk cement from trucks to the bins. There is also storage space for 1,500 barrels of sacked cement which can be dumped

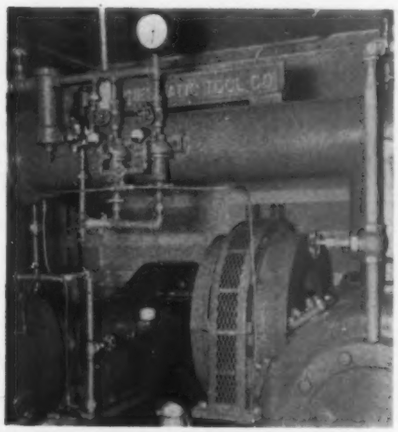


The cement-weighing batcher and its dial scale and feed-screws in the Valhalla plant.

The screw-conveyor and gates under the three main cement bins in the New York plant.



One of the two 250-gallon water-weighing tanks in the New York plant.



The 450-c.f.m. compressor in the New York plant which supplies the air for cement unloading.

through a hopper into the elevator.

The three service bins have a combined capacity of 2,000 barrels and are nested in the top at one side of the three main bins. All these bins are equipped with top-level Bindicators. Under the service bins are two screw-conveyors which feed the cement to the two cement-weighing batchers. One conveyor is 18 inches in diameter and 48 feet long and the other is 16 inches in diameter and 78 feet long. Each has a capacity of 5,000 pounds of cement in 30 seconds. The cement in any of the service bins can be chuted to the conveyor under the main bins if a quick change must be made to some type of special cement. All the screw-conveyors are driven through Philadelphia motor-reducers by Crocker Wheeler fan-cooled electric motors.

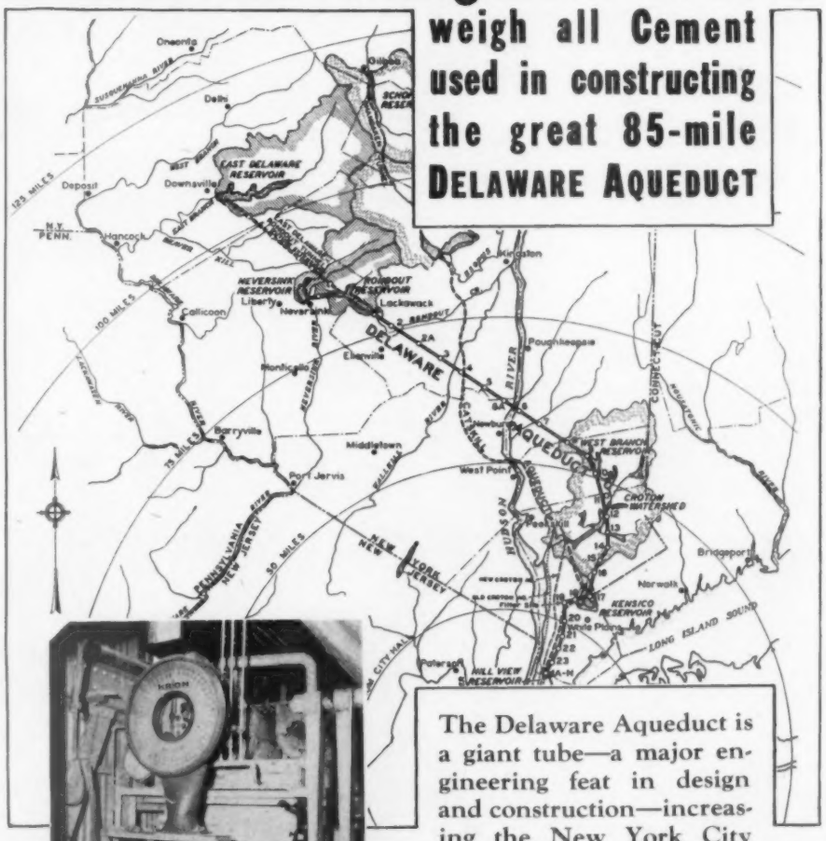
The pneumatic cement-unloading system is used for standard Portland cement and for sulphate-resisting cement. Special cements, including white, quick-setting and high-early-strength are purchased in sacks. Six different makes or types of cement can be stored.

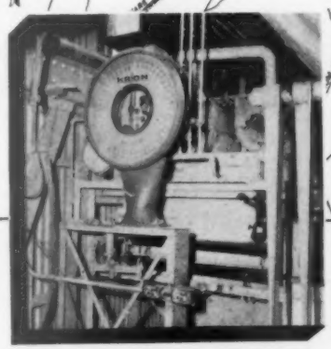
Each of the two screw-conveyors serves one of the two batching plants under the two aggregate-storage bins previously described. The cement is discharged from each screw into a 12,000-pound Blaw-Knox weigh-batcher which is equipped with a beam scale and an indicator. The aggregates are discharged from their bin compartments through manually-operated gates into two 6-cubic yard Blaw-Knox weigh-batchers which are also equipped

The crane which maintains stock-piles of aggregates at Valhalla plant.

KRON Batching Dial Scales

weigh all Cement used in constructing the great 85-mile DELAWARE AQUEDUCT





The KRON DIAL SCALE which automatically controls the cement batcher.

Kron Scales are standard equipment on the vast majority of batching plants for concrete, asphalt and various industrial processes. Write for Bulletin H-201.

The Delaware Aqueduct is a giant tube—a major engineering feat in design and construction—increasing the New York City water supply by 170,000,000 gallons daily.

The Valhalla plant north of White Plains, New York, which furnishes the concrete for this huge project, employs a KRON Dial Scale for weighing all cement passing from the stock bins into the batcher.

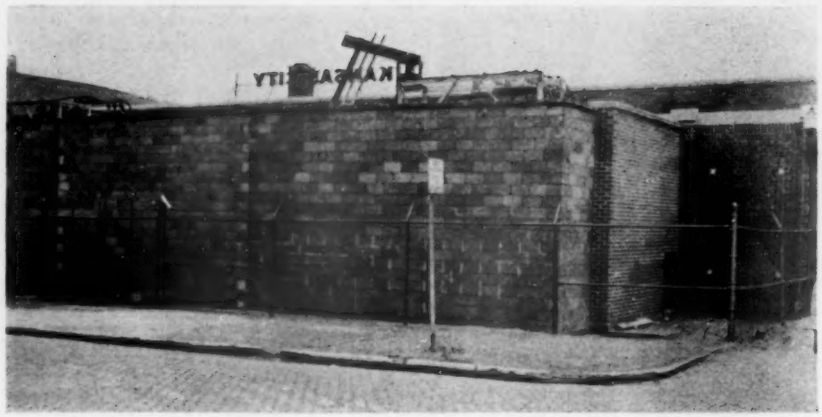
THE KRON CO. BRIDGEPORT, CONNECTICUT

with beam scales and indicators. Water is measured in a Jaeger 250-gallon siphon-type tank under the 450-ton bin and in a Blaw-Knox 250-gallon automatic tank under the 300-ton bin. The cement and the aggregates are discharged under each pair of batchers, the cement through a rotary valve, into a hopper from which the truck-mixers are loaded.

In cold weather the aggregates are heated by 3-inch steam coils on 12-inch centers in each bin compartment. The water is heated by live steam in two 3,500-gallon tanks with automatic temperature control. The steam is generated by a 125-horsepower horizontal marine-type oil-fired boiler.

A large part of the output of this plant has been used for public-works construction. The cement used in this concrete is tested at the plant and samples are taken by inspectors from traps at the feed ends of the screw-conveyors under the service bins. The concrete mixtures used in this type of work are designed by these inspectors, usually on a strength basis. All the mixing for such work is done after the truck-mixers arrive at the job.

The concrete supplied for ordinary commercial demands is designed by the company according to the Portland Cement Association's standards. Tables of proportions for the most commonly used sand-and-gravel mixtures are displayed over the controls on each batcher floor. The testing laboratory and the plant offices are located in the plant building and there is also a modern change room for the employees.



Switch gear protected by block inclosure in Kansas City.

Resistance of Units Tested by Rifle Fire

A new use for concrete blocks brought on by the war which has caught the interest of the concrete-products industry because of the possibility of widespread use, is the erection of bullet-proof protective walls for transformers, outdoor switches and other electrical installations.

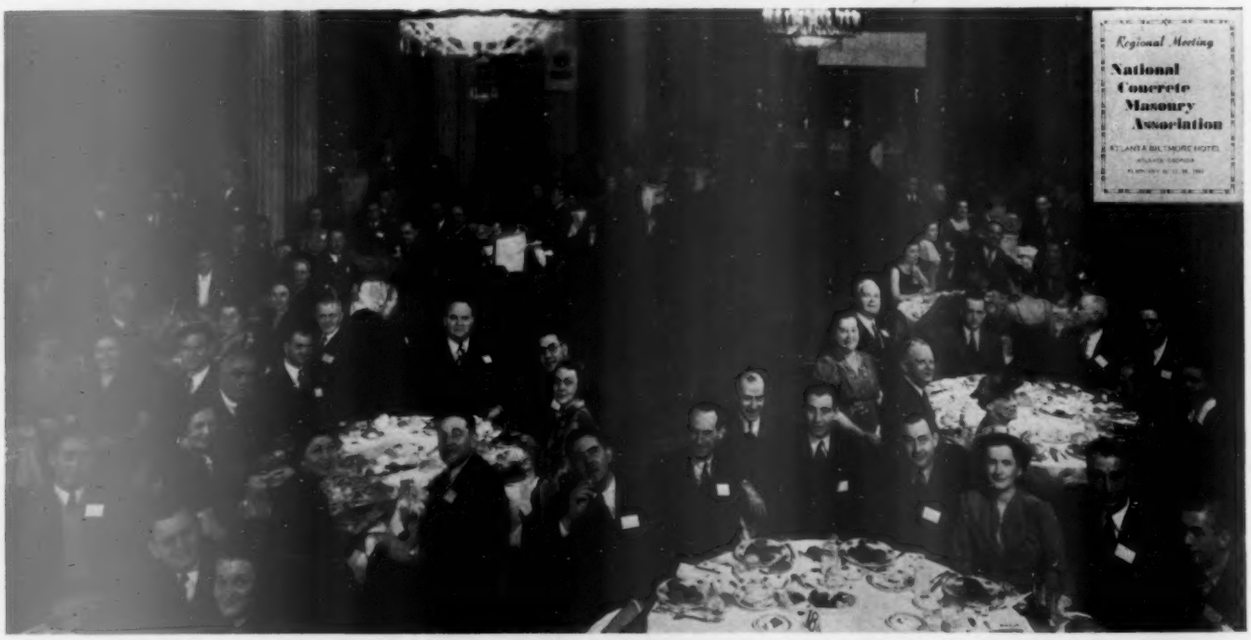
A convincing demonstration of the value of such walls was held on March 13 at the plant of the Mid-West Concrete Pipe Company, Franklin Park, Illinois. A wall composed of 12-inch lightweight units made with Celocrete aggregate was erected, the core spaces filled with sand and several rounds of ammunition fired point blank at various distances up to 75 yards without passing through the wall. The demonstration was witnessed by about 50 interested individuals and was sponsored by the Celotex Corporation.

The danger of sabotage of electrical installations can be almost entirely eliminated by protecting control equipment with sand-filled blocks and a number of such walls have already been built, an accompanying illustration showing a typical inclosure at Kansas City.

Colonial Concrete Obtains Charter

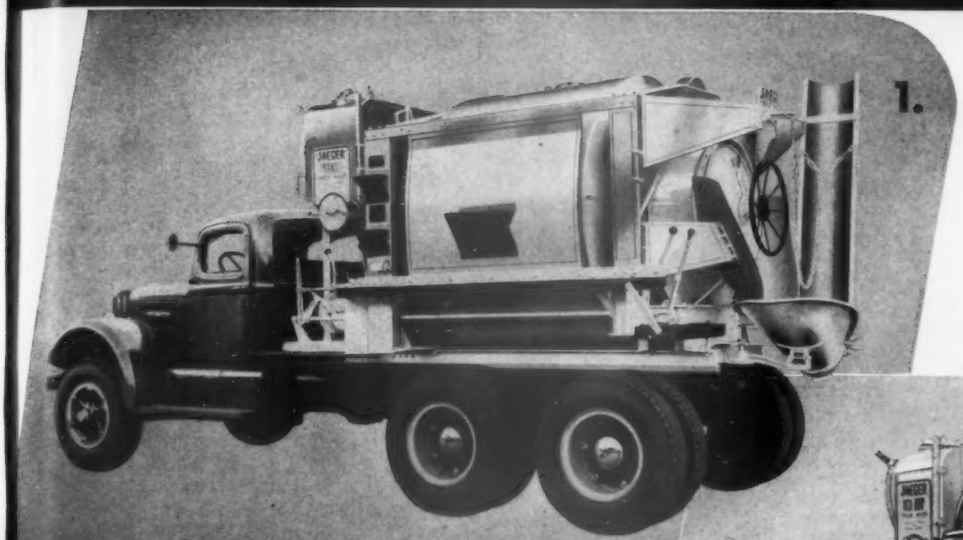
The Colonial Concrete Company has been incorporated at Louisville, Kentucky with a capitalization of $10,000. The articles were signed by B. H. Collings, E. W. Collings and Bess Collings.

The company has been supplying large quantities of ready-mixed concrete to the Charlestown Ordnance Plant in Indiana.



Banquet scene at the final regional meeting of the National Concrete Masonry Association, held February 16, 17 and 18 at Atlanta. Attendance exceeded 150 and the program following the same general outline as the preceding meetings at Buffalo and Kansas City. Chief speakers were Major E. M. Culligan, United States Army, and George C. Clarke, Savannah real-estate man.

Only JAEGER Equips You to Meet EVERY Ready-Mix Demand

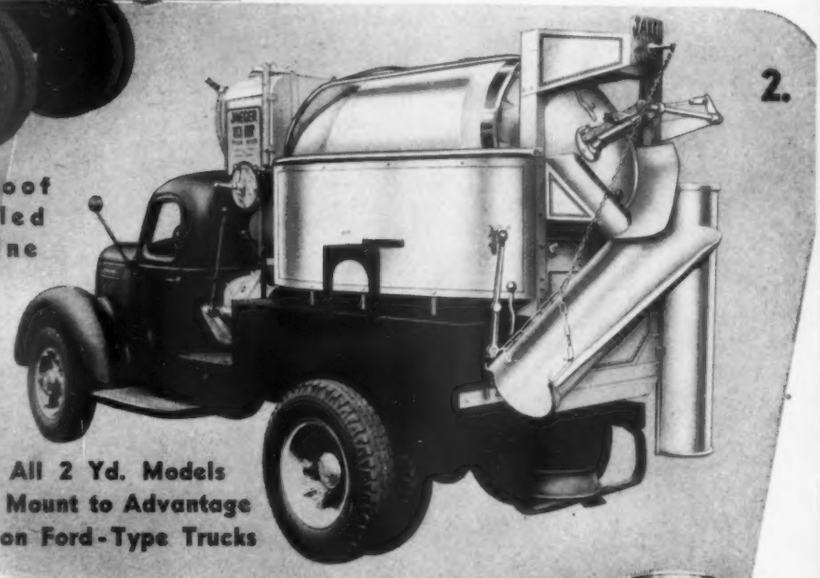


1.

All Jaegers Have 2-Speed Shock-Proof Transmission—Vacuum Cab Controlled Truck Engine Drive or Separate Engine

Standard LOW CHARGE

Type: Lowest, most economical to load; fastest on the market to mix and discharge — produce maximum daily yardage of proven higher strength concrete. Sealed drum meets any specification. Sizes 2 to 8 cu. yds.



2.

All 2 Yd. Models Mount to Advantage on Ford-Type Trucks

HIGH DUMP Types:

(2) Top Loading Models with "Sealed Drum"

(3) Or Combination Top and End Loaders (Pat'd)

Far outselling all other high discharge truck mixers today because they are fastest to load, mix and discharge any slump concrete — and are the only high discharge truck mixers that meet every specification and job condition.

"Sealed Drum" Models take full load in one quick drop through the top. Fast Vacuum-Controlled Discharge Door seals against loss of moisture and heat in winter concrete.

Jaeger End Loading Hopper Attachment (specially adapted to older or temporary plants not equipped for ribbon loading) offers many advantages over all other end loaders — and does not interfere with use of Top Loading Door where specified by engineers. (See details at right.)

Both types are built in 2, 3, 4 and 5 yd. sizes.

3.

Jaeger Charging-Discharging Hopper Attachment Permits Top or End Loading in Order to Meet Conditions - - -

The only end-loader which does not constrict drum opening and slow up charging and discharge. One quick turn of hand wheel opens Discharge Gate — no need to move entire Hopper (requiring many turns of a wheel) — no second seal to leak or wear.

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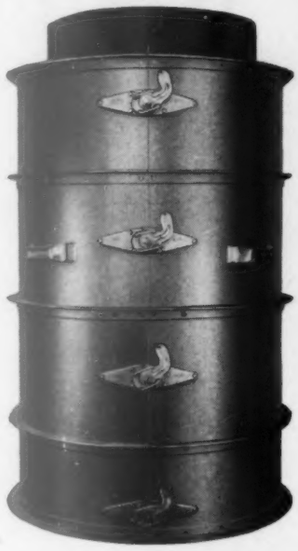

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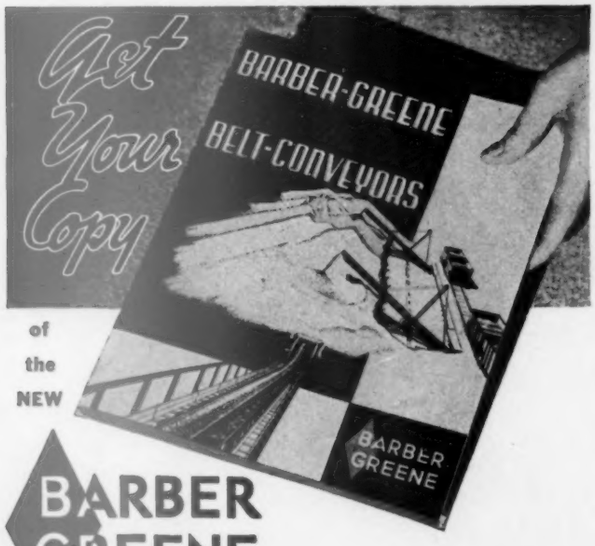

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Barber-Greene Company, Aurora, Illinois—Gentlemen: Send me without cost or obligation your new 116-page Belt Conveyor Catalog and Manual that not only shows the complete line of B-G *Standardized* Belt Conveyors, but has 20 pages devoted entirely to Engineering Data.

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THE "J & C" PRESS
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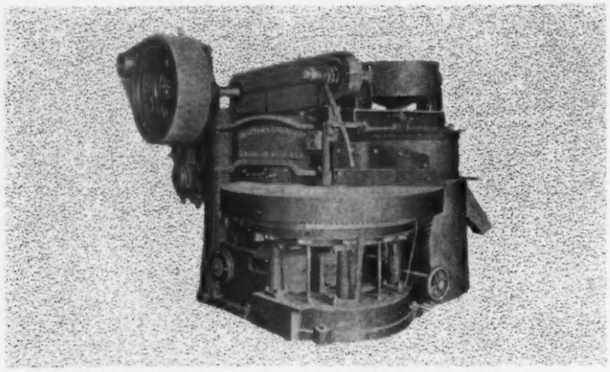

Users say that they can make high quality concrete brick *faster* and *cheaper* on a "J & C" automatic machine.

All brick are accurately sized—have clean, uniform edges—are smooth textured, and high in strength.

Brick can be produced either vapor cured or high pressure cured. High pressure steam curing eliminates expense of yard stocking and aging. NO PALLETS USED.

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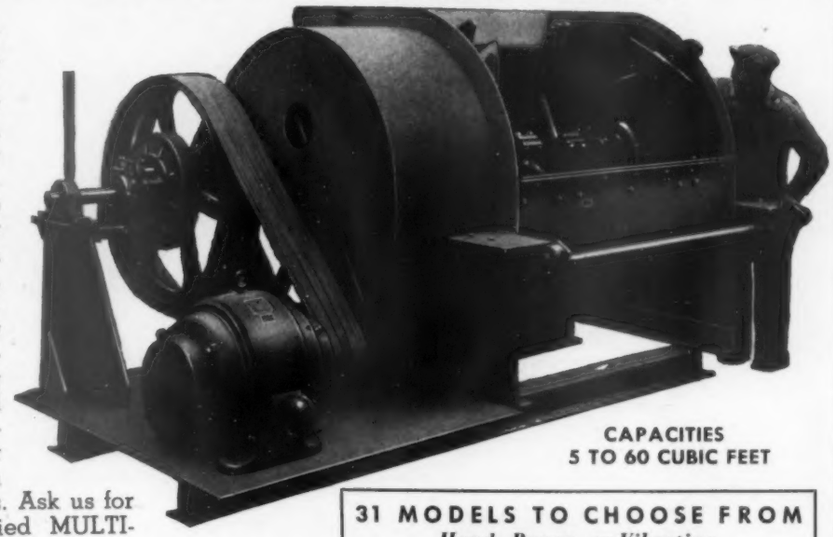

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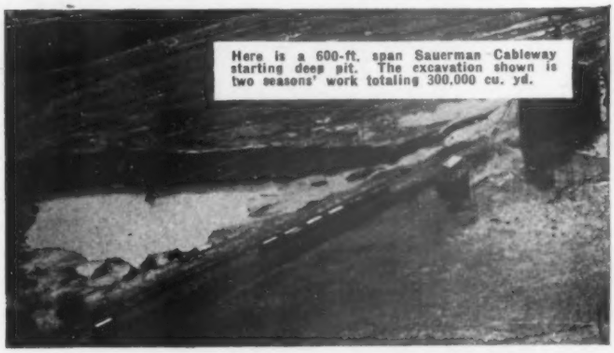

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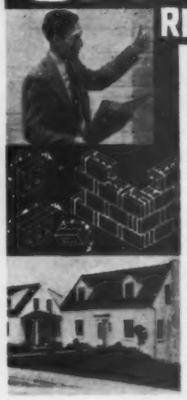

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Special construction features make Neff & Fry bins *high on strength and low on maintenance.*

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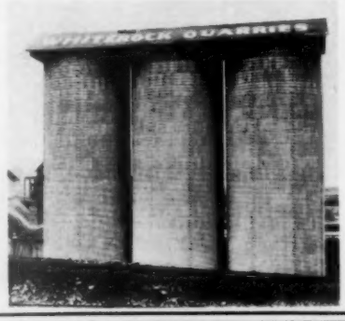

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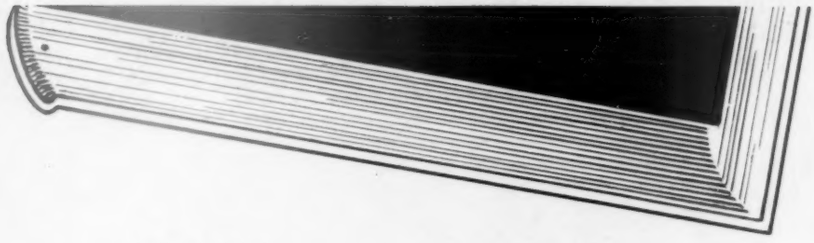

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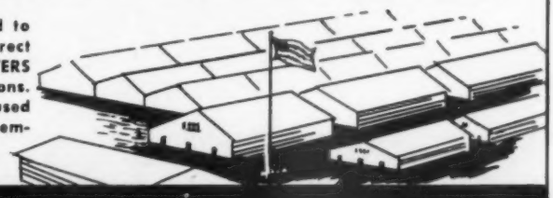

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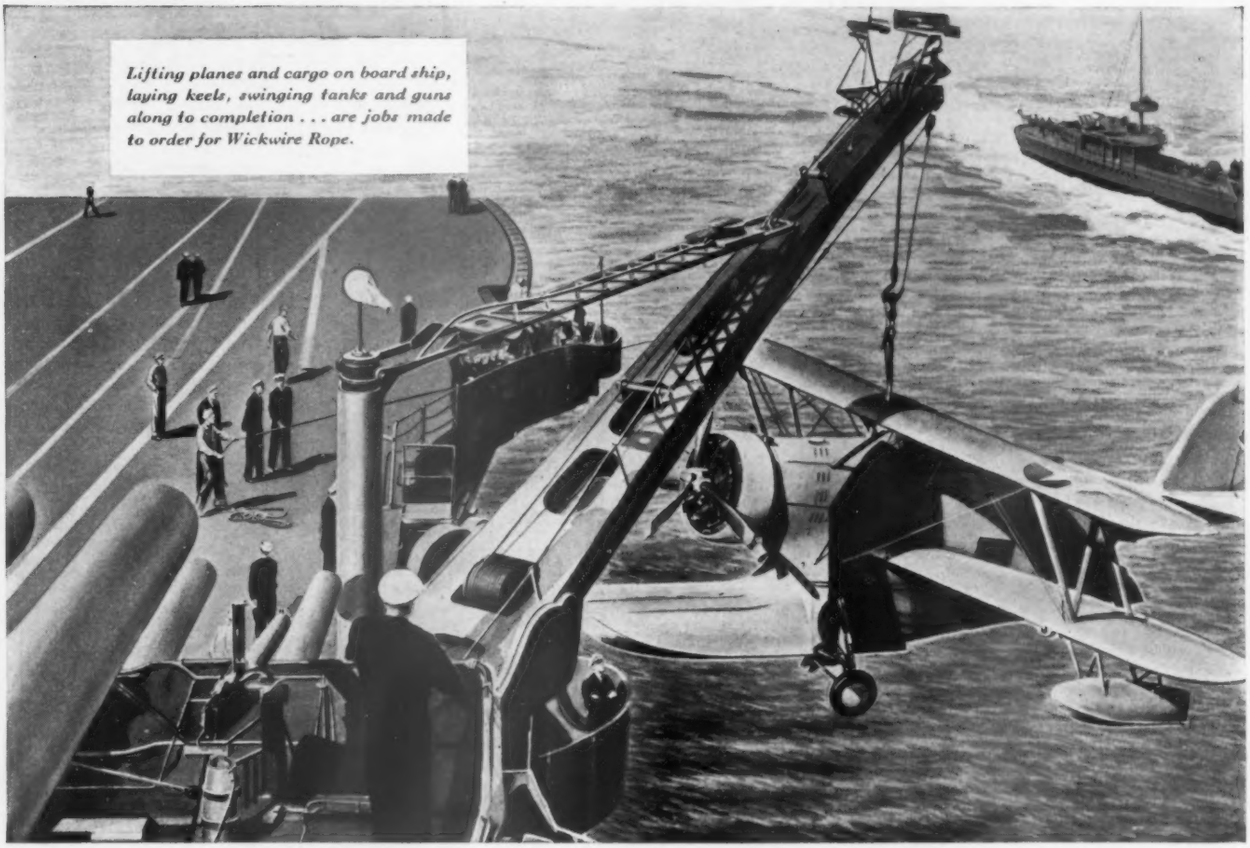

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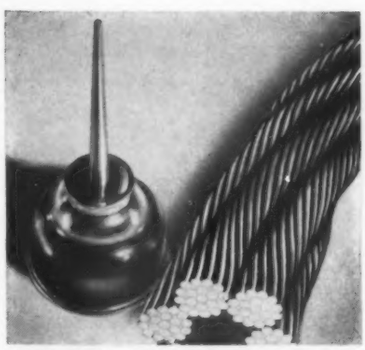

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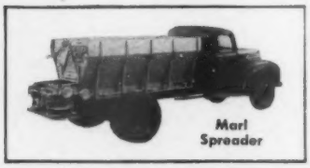

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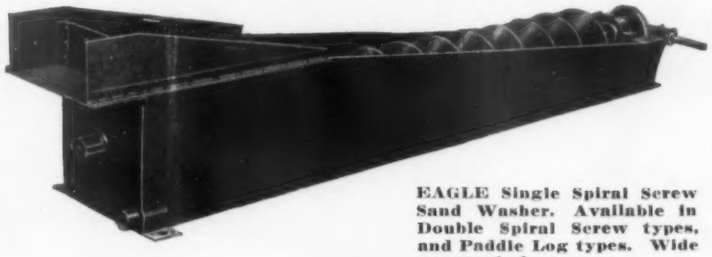

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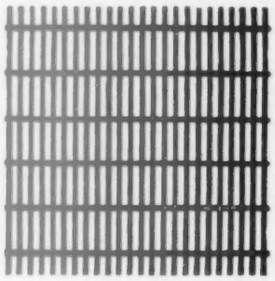

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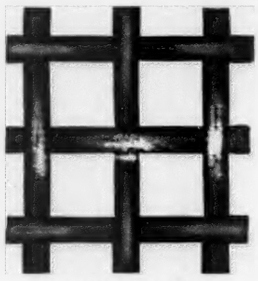

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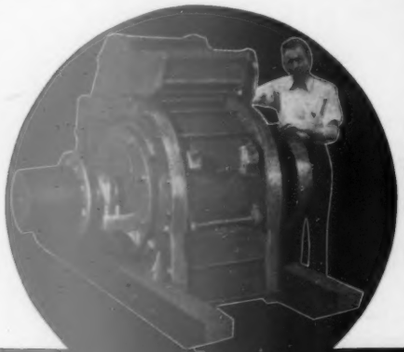

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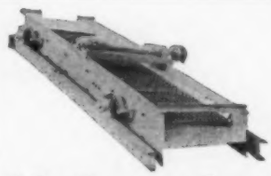

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3—1941 E.R. **Macks**, 5-7½ tons, 4-6 yd. Gar Wood Dump Bodies, Chain Drive, Air Brakes, New Condition—Just Overhauled—Driven Only 8,000 Miles.

WE CAN ALSO SUPPLY

25—A.C. **Macks** & Other Earlier Models, Heavy Duty Dump Trucks, with 6-10 yd. Bodies. All in A-1 Working Condition.

Some of these trucks may be purchased. Others had on rental, either bare or with operators, fuel and maintenance.

Complete List, Including Year, Model, Capacity, Condition and Prices on Request. Wire, Telephone or Write—Act Quick.

PUBLIC WORKS EQUIPMENT COMPANY, INC.
24—19 Forty-Fifth Street
Astoria, Long Island, N. Y.
Tel. RAvenswood 8-7443

FOR SALE

One 10-S Jaeger Mixer Non-Tilt type, Four Cylinder LeRoi Motor. Like New.

CROSSWICKS SAND & GRAVEL CO.
Crosswicks, New Jersey

SLIP RING MOTORS

Three Phase, Sixty Cycle, 220/440 Volts

1— 5	H.P.	MT 181	1200 RPM		
1— 7½	H.P.		1800 RPM		
1— 7½	H.P.	IM	900 RPM		
1— 7½	H.P.	HI—M	900 RPM		
1—10	H.P.	F	900 RPM		
1— 7½	H.P.	CI	680 RPM	Crane	
1— 7½	H.P.	CI	1200 RPM	Crane	
1— 7½	H.P.	CW	690 RPM		
3—10	H.P.	MT	900 RPM		
1—10	H.P.	MT	1200 RPM		
3—10	H.P.	I—M	1200 RPM		
1—10	H.P.	I—M	900 RPM		
1— 7½	H.P.	CW	900 RPM		
1—10	H.P.	Wagner	1200 RPM		
1—10	H.P.	CW	1200 RPM		
1—15	H.P.	MW	800 RPM		
2—15	H.P.	CW	900 RPM		
4—15	H.P.	CW	690 RPM		
1—20	H.P.	MT	900 RPM		
1—20	H.P.	CW	600 RPM		
1—20	H.P.	Wagner	600 RPM		
1—25	H.P.	CW	1200 RPM		
1—25	H.P.	HF	1200 RPM		
4—25	H.P.	CW	900 RPM		
4—25	H.P.	CW	690 RPM		
2—25	H.P.	CW	600 RPM		
3—25	H.P.	I—M	600 RPM		
2—25	H.P.	MT	1200 RPM		
1—30	H.P.	I—M	1200 RPM		
1—30	H.P.	Wagner	540 RPM	Crane	
4—30	H.P.	CW	900 RPM		
1—30	H.P.	CW	1200 RPM		
3—30	H.P.	Allis	900 RPM		
2—30	H.P.	MT	900 RPM		
2—30	H.P.	MT	1200 RPM		
1—20	H.P.	MTC	1200 RPM		
2—25	H.P.	I—M	680 RPM		
1—30	H.P.	Imperial	900 RPM		
3—40	H.P.	CI	690 RPM	New Crane	
2—40	H.P.	MTC	900 RPM	Crane	
1—40	H.P.	Star	900 RPM	Ball bear.	
3—40	H.P.	CW	900 RPM		
1—40	H.P.	MT	1200 RPM		
3—35	H.P.	I—M	900 RPM		
3—40	H.P.	MT	900 RPM		
2—35	H.P.	CI	690 RPM	Crane	
1—50	H.P.	CW	1200 RPM		
1—50	H.P.	Allis	1200 RPM		
1—40	H.P.	Allis	435 RPM		
3—50	H.P.	CW	900 RPM		
2—50	H.P.	MT	900 RPM		
4—50	H.P.	CW	680 RPM		
4—50	H.P.	MT	600 RPM		
1—50	H.P.	MT	680 RPM		
3—75	H.P.	CW	600 RPM		
2—75	H.P.	CW	900 RPM		
2—75	H.P.	I—M	1200 RPM		
2—75	H.P.	I—M	900 RPM		
3—75	H.P.	MT	900 RPM		
4—75	H.P.	MT	600 RPM		
2—75	H.P.	ITC	900 RPM	Crane	
3—100	H.P.	I—M	600 RPM		
1—100	H.P.	HF	1200 RPM		
1—150	H.P.	HF	600 RPM		
1—150	H.P.	ITC	680 RPM	Crane	
1—125	H.P.	I—M	680 RPM		
3—100	H.P.	CW	600 RPM		
1—100	H.P.	CW	900 RPM		
1—100	H.P.	MT	900 RPM		
1—100	H.P.	MTC	900 RPM	Crane	
2—200	H.P.	CI	600 RPM	Crane	
2—150	H.P.	CW	600 RPM		
2—125	H.P.	CW	600 RPM		
1—300	H.P.	I—M	900 RPM		
1—300	H.P.	MT	900		
1—400	H.P.	CW	1200		
1—200	H.P.	I—M	600		

Hand Control can be furnished for nearly all above and automatic for a large number.

PENN ELECTRICAL ENGINEERING COMPANY
Scranton, Pennsylvania

EQUIPMENT FOR SALE

6—**"DEMPSTER - DUMPSTER" HOISTING HAULING & DUMPING UNITS** mounted on 1938 models. Cab-over-engine, 2 to 3 tons Truck Chasses. Top condition.

1—**ALLIS CHALMERS**, Model "L" 75 H. P. **TRACTOR BULLDOZER**, wi h 10′ 6″ Baker Blade, full Hydraulic control. Can also furnish one 14″ Angle Dozer Blade.

4—**ALLIS CHALMERS, DIGGER, LOADER & BULLDOZER TRACTORS.**

2—**TREE MOVERS, MOUNTED ON E. H. MACK 5 TON CHASSES.** Especially designed for transplanting large growing trees, up to 7′ ball and 12″ trunk.

20—**BRAND NEW** 1¾ yd. **SNOW BUCKETS. "HAISS" & "HAYWARD."**

50—**MISCELLANEOUS CLAM SHELL, DRAG LINE, ORANGE PEEL,** and **TIP-OVER BUCKETS.**

2—**LORAIN "40" 8½ TON TRUCK CRANES** on A C Mack, 4 speed, pneumatic tired chasses, front and rear outriggers, 25′ booms with or without 10′ extensions.

1—**MULTI-FOOTE 27 E. CONCRETE PAVER.** New 1939. Serial 4514.

1—**LA PLANTE-CHOATE**, 18 yd. **BOTTOM DUMP WAGON.** Fine.

3—**HEIL** 10 yd. **"CARRY-ALL" SCOOPS.** Good working condition. Bargain.

1—**MODEL 2 NORTHWEST** ¾ yd. **SHOVEL.** New 1936. Completely overhauled. Double Drum convertible with Waukesha 4 cyl. motor —Recently completely overhauled. Presently equipped with ⅝ yd. dipper. Also includes 35′ boom with cables. Can supply clam shell and or dragline buckets.

1—**LORAIN 77**—1½ yd. **DIESEL SHOVEL.** Cat. D-13,000 motor. Double Drum convertible, presently rigged for shovel. Can supply 70′ boom with clam shell and or dragline bucket. Also new set fair leads.

MISCELLANEOUS PUMPS, CONCRETE MIXERS, PAVERS, GRADERS, and other Road Building and Quarrying equipment.

SALE OR RENT

50—**MACK HEAVY DUTY DUMP TRUCKS,** some are Brand New F.J. Models, see separate advertisement, Elsewhere, this section.

PUBLIC WORKS EQUIPMENT COMPANY, INC.
24—19 Forty-Fifth Street
Astoria, Long Island, N. Y.
Tel. RA vonswood 8-7443

FOR SALE—REBUILT EQPT.

BAY CITY Model "S" combination 1 yd. shovel, crane & dragline.
UNIVERSAL-LORAIN Mod. 35—⅓ yd. comb. shovel, crane, dragline.
P & H Model 450—1 yd. Shovel.
KOEHRING #1—¾ yd. crane & dragline. Can furnish ¾ yd. Shovel Front.
HEYWARD—1½ yd. clam shell bucket.
WILLIAMS—½ yd. clam shell bucket.
INDUSTRIAL WORKS—25 Ton—8 wheel steam Loco. crane—50 ft. boom.
WHITCOMB Model CS-4—4½ Ton 24″ Gauge Gasoline Locomotive.
3—PLYMOUTH Model FL-4 ton 24″ Gauge Gasoline Locomotives.
DAVENPORT 22 Ton—4 Wheel saddle tank Type—Std. Ga. Loco. Cyl.—11″x16″.
VULCAN—33 ton—4 wheel saddle Tank Type —Std. Ga. Loco. Cyl.—13″x18″.
CH&E #11—Triplex Road Pump.
NOVO—40 H.P. Gasoline D.D. Hoist.
CARRY-ALL TRAILERS—10 to 30 Ton.
10—BUDA Model 119 and Model 19-L motor section cars for standard gauge track, Buda air cooled gasoline motor.

Other Type of Equipment, Too
SOUTHERN IRON & EQUIPMENT COMPANY
Plant and General Offices:
ATLANTA, GEORGIA

FOR SALE

1—⅝ yd. Byers Gas full revolving crawler shovel.
1—⅝ yd. Byers "70" Crane-Dragline-Shovel and Backhoe Attachment.
1—Lorain 1 yd. Combination Crane-Shovel and Dragline—50′ Boom.
1—Blaw-Knox 3½ yd. Truck Mixer.
2—Jaeger 2—2½ yd. Truck Mixers—1 with Truck.
Osgood Victor IV Gas Crawler, Full Revolving, 1½ yd. Shovel, 6 cyl. Wisc. Engine, Elec. Starter.
1—IR type FM 2 Portable Wagon Drill.
1—360 ft. Chicago Pneumatic Portable Compressor.
1—310 ft. Sullivan Portable Compressor.
1—No. 50—IR Drill Sharpener.
1—No. 33—IR Drill Sharpener.
1—No. 50—IR Oil Furnace for No. 50 Drill Sharpener.
3—6″ Marlow S.P. Centi. Pumps—Gas and Elec. Power.
2—3″ Barnes Triplex Road Pumps—Gas.
1—4″ Rex Sgle. Plunger Pump.
4—3″ or 4″ Carter-Humdinger Diap. Gas Pumps—sgle. or dble., open or closed discharge.

NO PRIORITY REQUIRED

SERVICE SUPPLY CORPORATION
20th and Venango Sts. Philadelphia, Pa.

LOCOMOTIVES SHOVELS — CRANES CARS

1—67 ton Porter 6-wheel Saddle Tank, A.S.M.E. Boiler, Overhauled.
2—38 ton Vulcan 4-wheel Saddle Tanks, A.S.M.E. Boilers, Overhauled.
1—32 ton Porter 4-wheel Saddle Tank, Overhauled.

2—79 ton American 0-6-0 Separate Tender Switchers, Completely Overhauled, I. C. C. Condition, Built 1923.

1—17½ ton Brownhoist Locomotive Crane, Overhauled, New A.S.M.E. Boiler.

Crane or Dragline Fronts for Marion 37 and Bucyrus 50-B, One Each.

1—1½ Yd. Rehandling Clamshell Bucket, Practically New.

Birmingham Rail & Locomotive Co.
BIRMINGHAM, ALABAMA

12″ Steel Dredge Outfit with 300 HP motor.
1 yd. Cableway-Thomas Hoist—55 HP motor.
Gyratory Crushers: 12x46″ & 36″ TY Traylor.
10″ Newhouse, 10K & 18N 36″ Allis-Chalmers, MD.
Jaw: 10x30″, 12x26″ roller bearing Champion.
10x42″ Acme, 15x36″ Universal & Diamond.
24x36″ Farrell & 42x48″ Traylor.
Double Roll: 18x20″ McLanahan, 30x30″ & 42x 16″ Traylor.
Symons Cone: 2′ coarse & fine bowls, 3′ & 4′ coarse bowls.
Barber Greene & Haiss Bucket Loaders.
6-5 yd. Western 36″ ga. Dump Cars; some 2 yd. Koppel.
Two-40 ton Amer. std. ga. S.T. Locomotives.
One-70 ton std. ga. Lima Shay Rebuilt.
One-100 ton Amer. std. ga. Switcher.
Diesel Engines: 90 & 100 HP Fairbanks.
130 HP Caterpillar, 132 HP Waukesha.
175 HP Waukesha Gaso. & Natl. Gas.
5x5″ Weinman Acid-resisting Cent. Pump.

MID-CONTINENT EQUIPMENT CO.
Pa. 2290 710 Eastgate St. Louis, Mo.

FOR SALE

1—Bucyrus Dragline.
1—Fairbanks R. R. Scale.
2—38 yd. Batching Bins.
1—No. 8 Axflo Deep Well Pump.
1—10″ Fairbanks Centrif. Pump.
1—Pennsylvania Compressor.
2—38″ Perfect Classifiers.
1—No. 4 McCully Crusher.
1—Gasoline Caterpillar Crane.
6—75 KVA Transformers.

CARROLL BROTHERS, INC.
57 Wellington Rd.
Buffalo, N. Y.

For Sale

1—10″ F.H. Centrifugal Pump, Reversible Speed.
1—3″ High Pressure Centrifugal Pump.
1—200 H.P. Crocker Wheeler Motor—3 Ph. 60 Cyl. 585 R.P.M.—440 Volts. Primary and Secondary Control.
1—10 H.P. Crocker Wheeler Motor.
1—7½ H.P. Crocker Wheeler Motor.
Grids, Switch Boxes, etc.
315 Ft.—10″ Pipe.
600 Ft.—1¼″ Galvanized Pipe.
14 Heavy Galvanized Drums for Pontoons.
Rubber Sleeves for 10″ Pipe.
All equipment used only 3 weeks.

H. C. DOSCHER
2 Roswell Terr. Glen Ridge, New Jersey

Consolidated Can Help You Overcome Today's Conditions

ROTARY KILNS

5'x24', 7'x40', 6'x60', 7'6"x125'.

ROTARY KILN SPECIAL

10'x125' Power & Mining Mchry. Co., now Allis-Chalmers. ¾" shell, 14" tires, 16" supporting rolls, 8" roll journals, girth gear, 12" face. Used six months.

ROTARY DRYERS

Indirect Heat: 2—4'x20' Ruggles-Coles Type B-2.
Direct Heat: 5'x30', 6'x40', 6'x50', 6'x60', 7'x60', single shell.
Steam Tube: 6'x35' Louisville.
Atmospheric Truck Dryer: 24 truck Proctor & Schwartz Truck Dryer, 40 trays per truck, 4,166 sq. ft. tray surface, 10,858 lineal feet 1¼" piping, 125 lb. steam pressure in coils.

BALL, ROD AND TUBE MILLS

Tube Mills: 6'6"x22' Hardinge, straight side, iron lined with 300 H.P. direct connected A.C. motor.
2—5'x20' Bonnot silex lined Tube Mills with steel gears and steel heads.
2—6'6"x20' Smidth, silex lined.
5'x22' Allis-Chalmers, iron lined.

HARDINGE CONICAL MILLS

Silex lined: 4'6"x16", 5'x22", 6'x22", 6'x48", 8'x18", 8'x30".
Iron lined: 4'6"x16", 5'x22", 6'x22", 8'x18", 8'x30", 8'x36" with motor; 8'x48" with air classifier; 8'x48"; also 6'x16", with motor and balls.

CRUSHING ROLLS

Single Roll: 30"x30" Jeffrey, 21"x40" and 21"x50" Pennsylvania.
Double Roll: 42"x16" Allis-Chalmers Anaconda type, at Waukon, Iowa. 36"x16" Traylor and Allis-Chalmers.

AIR SEPARATORS

2—10' Sturtevant, 2—14' Gayco, 3—8' dia. Raymond double cone Separators, each with fan, cyclone, piping, etc. Can offer each of these Raymond Separators with 6' Hardinge ball mill.

RAYMOND PULVERIZERS

1—5 roll high side and 3—6 roll low side; also beater type pulverizers in No's. 0000, 00, 0, 1 and 3. Also No's. 60 and 90 Imp type.

STEEL STORAGE TANKS

Horizontal: 28—10x26', 10x36', 8x24'.
Vertical: 10x30', 10x25', 2—8x30', ¾" plate.

VIBRATING SCREENS

2—Sets of Type 39 double deck, 4x5' Tyler Hummers; 4x5', 2-deck; 4x7' Leahy 2-deck, motor driven; 3x10' Kennedy, 3-deck; 3x5' Kennedy, single deck.

LIME HYDRATORS

Weber Sr. type, made by Arnold & Weigel with No. 1 Raymond Bros. Lime Separator; also Kritzer.
One complete Hydrated Lime Plant.

GYRATORY CRUSHERS

1—16" Telsmith.
1—20" Superior McCully.
1—27" Gates, with 100 H.P. A.C. motor.
1—No. 410-TZ Traylor, 10" feed, can be set to ½".
3—Kennedy No. 19, No. 25, No. 49.
2—Telsmith No. 2-H and No. 3-F.
1—No. 40 Telsmith, 5" feed, ⅞" discharge; also No. 40 with 40 H.P. A.C. motor.
1—13" Allis-Chalmers Superior McCully.
1—15" Austin.

HAMMER MILLS

1—#9 "Mammoth Jumbo," 48" dia. x 72" face rotor.
1—24"x20" Jeffrey Type "H".
1—32"x15" Pennsylvania, 28" dia. x 15" wide rotor.
1—24"x24" Gruendler, "Whirlbeater."
1—#4XA Gruendler, 36" dia. rotor.

CONSOLIDATED PRODUCTS CO. INC., 17-19 Park Row, NEW YORK, N. Y.

Our Shops and Yard at Newark, N. J., cover eight acres.

CONCRETE EQUIPMENT

Erie 100 ton 3 compt. bin with weigh batcher.
B.K. 250 bbl. Cement Bin complete.
Various Floor Hoppers, Britches and Tremie.
Heltzel bin, 225 ton, 4 compts., weigh batcher.
Blaw-Knox complete ready mix concrete plant.
200 ton rock storage bin, steel, heavy construction.
Fuller Kinyon bulk cement unloader, portable.
Fuller C40 rotary air compressor, electric.
Ransome 28-S 1 yd. Stationary mixer, elec.
Ransome Dual drum paver 27E.
Barber-Greene Model 62 loader, cats.

SPECIALS!!

24"x36" Traylor Jaw Crusher.
15"x30" Traylor Jaw Crusher.
3—30,000 gal. Asphalt Tanks.
2—Ruggles-Coal Rotary Driers 6'x30'.
Allis-Chalmers cent. pump, electric, 3500 GPM, 50'.
20,000 gals. oil tanks with heating coils.
Steel Building 54'x110'x42'.
I.R. Air Compressor, 310 cu. ft. gas, portable.
Sullivan Air Compressor 1051 cu. ft. F-Morse oil engine.
Sullivan Air Comp. 110 cu. ft., gas, port.

BUCKETS—STONE SKIPS

22—Steel stone skips, 2 to 3 yds.
1 yd. Hayward rehandling clamshell.
Haiss 1 yd. rehandling clamshell.
2—½ yd. Haiss rehandling clamshell.
¾ yd. Haiss rehandling clamshell.
1 yd. Hayward orange peel, 4 leaf.
¾ yd. Hayward orange peel, 3 leaf.

SHOVELS—CRANES

Bucyrus-Erie Model 1030 electric tunnel shovel.
No. 50-B Bucyrus-Erie electric shovel, 2 yds.
Link-Belt Crane, gas, 50' boom, 1 yd. cap.
Brownhoist Crane, gas, 40' boom, 1 yd. cap.
Marion Model 32 Steam Shovel, 1½ yds.
Osgood Conqueror Gas Shovel, 1½ yds.
Universal 7½ ton Truck Crane.

LOCOMOTIVES—CARS

2—Vulcan 6 ton, gas, 36" gauge.
2—Whitcomb 4½ ton, gas, standard gauge.
8—3 yd. V type 36" ga. side dump cars.

CRUSHERS—PLANT

Gyratory crushers: K.V.S. 30, 37-S, 49; Telsmith 32, 8A, 8B; Traylor 8"; McCully 13", 8", 6".
Jaw: 6x12, 9x16, 10x20, 12x26, 13x30, 15x30, 16x32, 36x48, 48x60.
Symons 4' cone Crusher, complete.

RICHARD P. WALSH Co.
30 Church St. New York, N. Y.

LOUISVILLE KENTUCKY ROY-C-WHAYNE SUPPLY COMPANY. 800 W. MAIN PHONE WABASH 1375

9—**Dump Trucks**, G.M.C. Model 302, heavy duty, 1941; tires 8.25 dual rear, 7.50 front, equipped with two speed rear axles, body capacity 2½-4 yards, average mileage 12,000. These trucks are good clean jobs, in A-1 condition, have closed cabs, and are ready to go..... $ 1,150.00

1—**Road Pump**, High Pressure, Gorman Rupp, Triplex Road Pump, Model R-80, practically brand new, equipped with six-cylinder, 45 Horsepower Hercules engine, 4" suction, 3" discharge, rated capacity 80 to 110 gallons per minute, pressure 385 pounds to 500 pounds. This pump is absolutely same as brand new..... 1,500.00

1—**Shovel**, Koehring 1½ yard capacity, nearly new, 1941, powered by Model D-13000 Caterpillar Engine..... 23,000.00
Available April 15th to May 1st.

1—**Crusher**, Model 1036 Cedar Rapids, Roller Bearing. First class operating condition. 3,000.00

1—**Crusher**, Model 1040 Good Roads roller bearing crusher. Good condition and ready to go..... 2,850.00

1—**Crusher**, Model 1030 Wheeling roller bearing. Good operating condition..... 1,675.00

1—**Trailer**, Carry-All Type, Rogers, gooseneck type, pneumatic tired has 8 rear wheels on four rocking axles, four front wheels, rocking axles. Tires 9.75 x 15 pneumatic rear, 10.50 x 20 front; platform height 29" 9-ft. wide, 16-ft. long, capacity 25 to 35 tons. Entire trailer including tires A-1 condition..... 2,895.00

2—Adnun **Blacktop Pavers**, Hercules gasoline engines, good repair, price each..... 4,000.00

1—**Concrete Paver**, Model 27E Koehring, with boom and bucket, equipped to meet Indiana State Highway requirements, just finished a job..... 2,250.00

1—**Trenching Machine**, Barber Green, Model 44C, 6-Cylinder Buda engine, will dig up to 22" wide and 5'6" deep, good condition..... 3,350.00

1—**Shovel—Trench Hoe**, Northwest, Model 2, ⅝ yard, Wisconsin gasoline engine, price for the combination shovel and trench hoe 5,000.00

1—**Wagon Drill**, Cleveland, late model DR8, equipped with D-14 drifter, 4". This drill is practically new..... 900.00

1—**Compressor**, stationary, Ingersoll-Rand, type XCB, two stage, 870 cu. ft. displacement, 733 cu. ft. actual air capacity, complete with 125 HP Westinghouse Electric motor belted..... 3,895.00

1—**Diesel Power Unit**, International model UD-18, 6-cylinder, 100 Ho sepower, brand new with clutch..... 2,395.00
(No priority required.)

1—**Crane—Dragline**, Lima model 601, 1¾-yd. capacity, serial 375 series, equipped with Caterpillar D13000 Diesel engine, crawler mounted. This is a combination crane and dragline, has a 60-ft. boom. Good machine, ready to go to work..... 15,500.00
Extra for Koehler lighting plant now with machine..... 300.00

1—**Reduction Crusher**, Telsmith, intercone, size 28", brand new, only operated five days, bought 1941, equipped with V-belt sheave..... 3,995.00

3—**Crawler Wagons**, Athey, bottom dump, 18 cu. yd. capacity, six months old, each... 2,250.00

1—**Crane Shovel**, combination Bucyrus-Erie Model 21-B. Serial No. 114600. Engine 4-Cylinder gasoline with electric starter. Shovel capacity ¾ yd. Cable crowd. Crane ¾ to 1-yd. capacity, boom 65 ft., including 2 piece 40 ft. with 20' and 5' center sections. Has not been overhauled but is in good operating condition. Ready to go from Louisville Stock. 7,450.00

DEPENDABLE USED EQUIPMENT

FOR SALE

IMMEDIATE DELIVERY

All Steel Welded Elevator Buckets of Any Size—Made of ⅛" or 9/16" Plates.

C. L. FIELDER CO.
Roanoke, Va.

FOR SALE

MARION Mod. 36, **combination, steam shovel crane and dragline**—1½ yd. cap.
LORAINE—75 gasoline operated caterpillar shovel or will convert to crane. 1 yd. cap.
CLAMSHELL BUCKETS—½, ⅝, ¾, 1, 1¾ & 2 yd.

P. A. HENAULT
2140 Book Bldg. Detroit, Mich.

REBUILT TRUCK MIXERS

For Rent or Sale
All Sizes
With or Without Trucks

7—2 yd. Separate Engine Drive Truck Mixers, Mounted on Fords and Chevrolet—Good Running Condition, Now Working, Immediate Delivery. PRICE EACH.....$1500

27-E MULTI-FOOTE PAVER
Road Forms—Finishers

THE JAEGER-LEMBO MACHINE Corp.
Corona, N. Y.
Phone: NEwtown 9-7777

Jaw Crushers—4"x8" up to 66"x84".
Crushing Rolls—16"x10" up to 54"x24".
Gyratory Crushers—No. 3 up to Mammoth.
Ring Roll Mills—No. 0, No. 1, No. 1½ and No. 2.
Swing Hammer Mills.
Rotary Fine Crushers—No. 0, No. 1, No. 1½ and No. 2.
Direct Heat Rotary Dryers—3½'x25', 4'x30', 5'x30', 5½'x40', 6'x50', 7'x50' and 8'x50'.
Semi-indirect heat Dryers — 5'x30' and 8½x75'.
Cement Kilns—3' up to 8' diameter.
Hardinge, Marcy & Fuller-Lehigh Mills.
Raymond Mills—No. 00, No. 0, No. 1, No. 2 Roll.
2—6'x12' and 1—4'x10' rod mills.
Tube—Rod and Ball Mills—3' to 6' diameter.
Vibrating Screens—Air Separators.
1—4'x4' and 8'x6' ball mills.
New Dryers built for all purposes.

W. P. HEINEKEN
277 Fulton St., N. Y. Tel.: Barclay 7-7298

1—Farrel Jaw Crusher, size 20"x10".
2—Rotary Revolving Segment Screens, size 56"x18'.
1—Bucket conveyor, 44 ft. centers with 18" buckets.
1—Belt conveyor, 20" wide, 55 ft. centers. All complete with foot wheels and head wheels.
1—250 H.P. Fairbanks-Morse slip ring motor, 600 RPM, 3 phase, 60 cycle, 2300 volts with secondary drum controller, resistance and panel board with oil switch, type BV.
1—Model 60 Caterpillar Tractor with Bulldozer.

Large quantity of belting and shafting.

S. GRAF
327 Hewes Street Brooklyn, New York

ELECTRICAL MACHINERY

Motors and Generators, A.C. and D.C. for sale at attractive prices. New and Rebuilt. All fully guaranteed. Write for List and Prices.

V. M. NUSSBAUM & CO.
FORT WAYNE, IND.

NEED DUMP CARS?
Immediate Delivery:
16, 4-yd. Koppel
9, 20-yd. Koppel
3, 20-yd. Western
24, 16-yd. Western
11, 16-yd. Kilbourne & Jacobs
62, 12-yd. Western
Illustrated specifications available—Other Types of Cars Too. Also Locomotives, Cranes, Shovels, Etc.

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30"	5	1/8" — 1/16"
24"	5	1/8" — 1/32"
24"	4	1/8" — 1/32"
20"	5	1/8" — 1/32"
20"	4	1/8" — 1/32"
18"	4	1/8" — 1/32"
16"	4	1/8" — 1/32"
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1¼ Yd. BUCYRUS 41B Steamer.
1½ Yd. Lima 750 Diesel.
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5½x18 P & M Tube Mill Silex.

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GRUENDLER XXB Mill & Jay Bee No. 3 & 4.
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400 Bbl. Portable BUTLER Bulk Cement Bin with Fuller Full Automatic Electric Push Button Weigh Batcher.

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100 K.W. RIDGWAY 3/60/2200-250-275 volt.
150 K.W. GEN. ELEC. 3/60/2200-250-275 volt.
200 K.W. RIDGWAY 3/60/2200-250-275 v., 900 rpm.

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300 K.W. Worthington 3/60/2400 v.
125 K.W. F.M. 250 v. D.C.

RAYMOND MILL
5 Roll High Side.

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BELT: 1000 Ft. 60 In., 700 Ft. 42 In., 600 Ft. 36 In., 800 Ft. 30 In., 1642 Ft. 24 In., 517 Ft. 20 In., 297 Ft. 18 In., 1000 Ft. 14 In. & 16 In.
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LOCOMOTIVES
DIESEL: 7—4½, 8 and 15 Ton 36 & 42 In. Ga.
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STEAM: 9 Ton, 20 Ton, 40 Ton, 60 Ton & 80 Ton.
ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 17 Ton & 40 Ton.

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4 LINK-BELT A-60 In. Classifiers.
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30" Reciprocating Plate Feeder.

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12—50 Ton Cap. Battleship Gondolas.
7—50 Ton Cap. Flat Cars.

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1—¾ yd. Gas 1—1½ yd. Electric
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350 Ft. Barber-Greene Sectional Steel Frame Roller Bearing Belt Conveyor. New 1939.

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Symons No. 5½ and 7 Ft.

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DIESEL MONIGHAN DRAGLINES
3 W 90 ft. Boom; 4 W 100 ft. Boom.
5 W 130 ft. Boom; 6 W 150 ft. Boom.

DIESEL SHOVEL DRAGLINE
2½ yd. Bucyrus Erie 55 B Diesel Shovel and 70 ft. Boom Caterpillar Dragline.

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2 GARDNER DENVER Model G D-9 Tunnel Loaders, SULLIVAN DRIFTER DRILLS.
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4 Compt. 380 ton Steel Bin, Elevators, Weight Hopper 2 Yds. Smith Tilting Mixer 600 Bbl. Cement Bin, 220x24 Belt Conveyor, etc.

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1—**BUCYRUS-MONIGHAN** Model 6-W. Diesel operated. 135' Boom. 6 yd. Bucket. 8 years old.

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***See also Detail Information in the 1942 Pit and Quarry HANDBOOK**

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THE CITY OF NEW YORK HAS APPROVED

$(SC)^2$

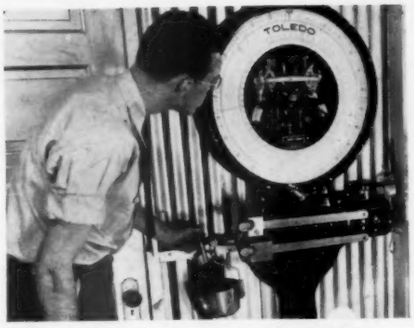
874-41-SA.
APPLICANT—Scientific Concrete Service Corporation, owner.
SUBJECT—$(SC)^2$ Method of Precision Control in Concrete Manufacture, approval of.
APPEARANCES—
For Applicant: R. F. Moss.
ACTION OF BOARD—Appliance approved in accordance with report of Committee on Tests.
THE VOTE TO APPROVE—
Affirmative: Chairman Murdock, Commissioners Savage and Blum and Deputy Chief Gunn..... 4
Negative: 0

* * * * * * *

WHEREAS, this report recommended approval of this appliance.
Resolved, that the Board of Standards and Appeals does hereby *approve* the appliance known as the $(SC)^2$ method of Precision Control in Concrete Manufacture, on condition that the appliance be installed, and labelled, stamped or tagged in accordance with above report.

From the Bulletin of the Board of Standards and Appeals, City of New York, January 27, 1942

After a careful investigation by the engineers of the Board of Standards and Appeals official approval of the $(SC)^2$ Method for use in the Metropolitan Area has been granted. It was based on proven results. A copy of the engineers' report will be mailed upon request.



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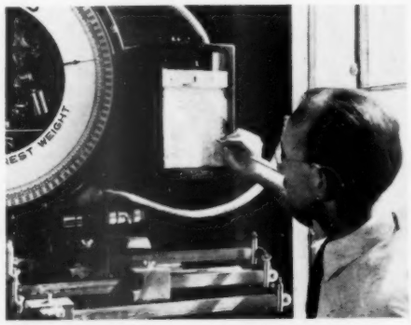

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SCIENTIFIC $(SC)^2$ CONCRETE

SCIENTIFIC CONCRETE SERVICE CORPORATION $(SC)^2$ WASHINGTON, D.C.

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